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Clinical studies demand in the first place an accurate recognition of the various abnormalities or disturbances of function which can be attributed directly or indirectly to a lesion or disease of the organ, or of the part of the organ, that is affected. These abnormalities form the "symptom-complex" or "syndrome" by aid of which we endeavour to diagnose and localise the pathological changes that interest us. But though the recognition of symptoms alone is often sufficient for practical purposes, a further analysis of them and their interpretations by simpler principles, invariably enables us to evaluate them more correctly and to employ them more accurately. And it is only by such an analysis of symptoms that we can utilise clinical observations to advance our knowledge of the functions and of the mode of working of the body and its parts under normal and pathological conditions. The value to physiology of conclusions obtained from a careful analysis of functional abnormalities in man is obvious in the cases of the central nervous system, as the complex evolution of the human brain distinguishes it in many respects from that of the animals usually employed in experimental research, and more particularly, since the intelligent coöperation of our subjects enables us to investigate the anomalies produced by nervous lesions more intimately and more thoroughly than is often possible in animals. The study of the symptoms of cerebellar disease attempted here is devoted to these two objects; to a perfecting of our methods of diagnosis and localisation, and to an inquiry into the normal functions of the cerebellum. These aims will make it necessary to deal with each symptom or a group of allied symptoms separately, and in that order which will throw most light on cerebellar physiology. The first to demand our attention, since it is one of the most important and fundamental, is disturbance of tone.

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Since the experimental observations of Luciani, disturbances of muscle tone by cerebellar lesions have attracted much attention, and have also been a subject of controversy. Ferrier failed to detect any "atonia" in his animals, Babinski has stated that there was no "atonia" in most of the cases which he has examined, and even as late as 1911 André-Thomas wrote that he had never observed muscular relaxation or hypotonia, in the sense given to it by clinicians, in his patients. Myers has recently stated a similar experience.

The explanation of the many opposing statements in the literature of cerebellar disease obviously lies in the conception of what muscle tone is. The clinician usually applies the term to that slight constant tension characteristic of healthy muscles, owing to which the limbs when handled or moved passively offer a definite resistance to displacement, or require more force to move them than the hypotonic limb of the advanced tabetic or the limb in a state of flaccidity owing to injury or disease of its peripheral nerves.

To Sherrington we owe another conception of the nature of muscle tone and the part it plays normally in the motor activities of the animal. Tone, according to him, is only postural contraction, that is, the tonic contraction of muscles owing to which a limb when brought into a new posture by active or passive movement remains in that new posture. It is excited reflexly from peripheral afferent end-organs, and mainly from those of the contracting muscles. Tone is therefore a proprioceptive reflex adapted to the maintenance of posture. This property depends on its plasticity, as the muscles fixing a limb at any joint adjust their length to that necessary for this attitude, and exert tension regardless of their length. Further, when acting statically—that is, preventing displacement of parts of the body by other forces—the muscles though in a state of tension do no mechanical work and are not subject to fatigue.

Another important function of tone is that it fuses with muscular contractions otherwise excited, reinforcing them, making them more tonic, and maintaining their contractions after cessation of the stimulus. The contractions of a toneless muscle are therefore more intermittent and clonic, and the muscle is more subject to fatigue than the normal when employed in continuous work or in the maintenance of an attitude. The importance of this conception of tone can be fully understood only when it is realised that every movement accurately adapted to its aim must not only start from a definite posture and end in a posture, but that the movement itself consists of a series of postures; and that its accuracy depends largely on the correct postural fixation of those parts of the body on which the limb, or segment of the limb, is moved.

In applying Sherrington's conceptions to clinical work we are met with the difficulty that there are few tests or "signs" by which disturbances of postural tone can be immediately recognised or measured; and that it may not be possible to distinguish it from voluntary or automatic muscular contractions in the conscious patient. All muscular contractions that maintain an attitude cannot be regarded as merely a manifestation of reflex postural tone; if a finger brought to the tip of the nose, for instance, remains

* Lectures II., III., and IV. will be published in subsequent issues of THE LANCET.

there for a time, it is obvious that the arm is held in the appropriate attitude mainly by voluntary effort, and the maintenance of the erect attitude in standing is, to some extent, dependent on this too. In each of these instances plastic tone may stabilise the contractions initiated by volition, but we still lack clinical tests by which to distinguish it directly.

Method of Study.

The disturbances of tone which result from a destructive lesion of the cerebellum are most easily studied in cases in which one side only of this organ is damaged. They are then limited to the homolateral musculature, and we are consequently able to contrast the states of the muscles on the normal and abnormal sides. On merely handling the affected limbs it is at once noticed that they can be displaced or moved passively more easily than the normal, and that no such resistance is encountered as that offered by the stretching of normally toned muscles. In severe affections flexion, extension, and other movements at any joint demand no more power than that necessary to bear the weight of the segments distal to this joint; it is as though each segment of the limb were tied loosely by a string to that proximal to it. To handling, the limb may suggest at once that inert flaccidity of the muscles of a person deeply under an anæsthetic, or of a corpse recently dead. When the lack of tone is considerable the limb can be flung about as if it were merely a dead mass; the moving hand may strike the bed or even the patient's face or other part of his body with the full inertia of its movement. This lack of resistance to passive movement may be seen in the limb girdles too; a sharp blow on the scapula may cause it to slide forwards on the thorax in a manner never seen on the normal side. Passive displacement at any joint may be, in fact, restricted only by the articular ligaments that normally limit the range of movement.

The unsupported segments of the limb also lie more inertly than those of the normal side; if the upper arms be supported horizontally on a bar the affected one rotates inwards at the shoulder and flexes at the elbow owing to the weight of the forearm, and the hand and fingers hang more passively, and if the forearms are held vertically the wrist of the affected side may flex, owing to the weight of the hand, to a smaller angle than in the normal limb. Similar changes can be observed in the lower extremity when it is handled or moved passively; if the thigh is quickly abducted the elastic resistance that the adductors naturally exert may be no longer felt, and it is often possible when the knee is extended to depress the patella further than on the normal side.

All these phenomena indicate that the elastic tension that in normal muscles resists their elongation or stretching is defective on the side of the cerebellar lesion. This is the explanation, too, of the fact that the affected limbs not infrequently occupy unnatural attitudes, or attitudes which would be corrected quickly in the normal limb owing to the discomfort produced by an unusual degree of stretching of well-toned muscles. The hand may lie for long periods prone on the bed with the fingers fully straightened out or even hyperextended, and in attempting to rise into the sitting position the patient may throw his weight on the dorsum of the affected hand so that the fingers and wrist are flexed to a degree that would be naturally uncomfortable. It seems probable that owing to the lack of tension the sensory end-organs of the muscles are not stimulated by the stretching to the same extent as in normal muscles.

The lack or diminution of tone in the muscles can be also demonstrated by seizing one of the proximal segments of the limb and shaking it; then the distal segments flop or sway about inertly, like the arm of a flail, their passive displacements not being controlled or checked by the tension of those muscles stretched by each excursion. The freer and more inert swing of the affected limb is usually obvious to the eye, but it is even more unmistakable to the observer's hand, for while the oscillations of the distal segments of the normal arm or leg are arrested by the elastic tension of the muscles, the affected limb swings unchecked till further movement is prevented by the bony and ligamentous structures of its joints. The end of each movement is therefore more abrupt, and at the termination of each the joints seem to "lock" and consequently transmit a jar to the hand that shakes the limb.

The same unresisted passive swaying of the affected limbs may be also observed when the patient's whole body is suddenly displaced or shaken, and in rapid voluntary movements a similar inert swinging may occur at joints not directly concerned in the action; in flexing and extending the elbow alternately, the affected wrist may be flexed and extended by the inertia of the movement, so that the hand is flung against the shoulder or to the bed, and the affected elbow may be jerked from its support by the momentum of the flexing forearm. These observations reveal a deficiency of the normal tension in muscles that should fix the joints in appropriate postures.

Deficient Muscular Elasticity.

The elasticity of the muscles is often deficient too. If the pronated forearm is grasped firmly and suddenly jerked, as if the observer were trying to crack a whip, the hand of the normal side after flexing swings back in extension owing to the elastic tension of its extensors, but that of the affected limb sways passively, or recoils only when arrested by the inelastic ligaments of the wrist-joint. This lack of elasticity can be easily demonstrated in the lower limbs too; if the observer, placing his hand under the patient's thigh while he lies prone, jerks this suddenly and unexpectedly upwards, the normal leg is usually carried up since the knee-joint remains extended or extends again after a preliminary flexion, but the heel of the affected limb remains on the bed, or immediately falls inertly, owing to deficiency of tone in the quadriceps extensor muscle. Similarly, on suddenly dorsiflexing the wrist the fingers may not flex, or flex to a less extent than those of the normal side, owing to lack of tension in their long flexors. Frequently, too, the heel can be approximated more closely to the buttock by passively flexing the hip and knee; more than one patient noticed this and commented on the greater ease of such a movement when actively performed, and the less strain experienced when it was passively done.

It has been stated that cerebellar hypotonia does not lead to an increase in the range of passive movement; in my experience that is not wholly true. In joints in which movement is normally arrested by ligaments or by apposition of bony surfaces, no increase of range can be found, since cerebellar disease does not lead to relaxation of the ligaments, but in those where the tension of the muscles normally checks movement the possible range may be definitely greater on the affected side.

These various tests were carried out with the muscles in as complete a state of voluntary relaxation as it was possible to obtain, but the same disturbances can be demonstrated, in cases with moderate or severe hypotonia at least, even when the patient attempts to control passive displacements of his limbs. The extended arm or leg oscillates more widely than the normal as the result of a tap, even when the patient is requested to prevent the limb giving way to the blow; and when the arm is seized above the elbow and shaken its distal segments sway too widely even though the subject is asked to hold them steadily. It appears, therefore, that under these conditions voluntary muscular contractions cannot supplement efficiently the loss of postural tone, and that postural tone is a necessary adjuvant to those muscular contractions by which we voluntarily maintain our limbs and body in determinate attitudes. That this is so is also shown by the fact that even small lesions of one-half of the cerebellum may affect the maintenance of voluntary posture. When the two arms are outstretched horizontally the affected one tends to fall away under the influence of gravity and has to be

repeatedly replaced by voluntary effort. In cases of severer damage the affected limbs are often unable to maintain any attitude if unsupported; they sway about in an inert purposeless manner, and in severer cases may fall unexpectedly as though the muscles that held them up had suddenly relaxed. This is particularly liable to occur if equal weights are suddenly dropped on the two limbs; the affected one "gives" under the increased load to a much greater extent than the normal.

Our observations consequently show that a lesion of the cerebellum diminishes the muscle tone which reflexly fixes the postures of the body and its parts, that it reduces the elasticity of the muscles, and that it disturbs the tonic element in the voluntary contractions of muscles directed to the maintenance of posture.

Distribution of Hypotonia.

The next question that arises is the distribution of this disturbance of tone. When a lesion involves a large part of one-half of the cerebellum, there can be no doubt that the hypotonia is rigidly limited to the limbs of the same side, and it probably affects all the muscles of this side. In the limbs it is general, though its manifestations are often more pronounced at the proximal than at the distal joints. It is less easily recognised in the muscles of the trunk, but the abnormal attitudes that this assumes, and the more easy displacement of the patient or of his limb girdles in those directions which the tension of the homolateral trunk muscles resist, indicate that it extends to these too. It is rare to find any definitely abnormal asymmetry of the face in unilateral lesions.

Whether small local lesions of the cerebellum produce disturbances of tone in certain regions of the body, or in certain groups of muscles only, is important, especially in reference to the theory of cortical localisation. I have had the opportunity of investigating a large number of cases of gunshot wounds with such circumscribed lesions, in both their earlier and later stages, and my experience has been that when small injuries disturb tone the disturbance is never limited to one limb, or to a segment of a limb, or to one or more groups of muscles. If the arm is affected the leg presents hypotonic symptoms too, though they may not be so easily demonstrated, and the relative affection of different segments of the limb follows that which occurs in more extensive lesions. I have been unable to detect that anisosthenia, or hypotonicity of some muscles with relative increase of tone in their antagonists, which Rothmann and Thomas and Durupt have described in animals after removal of small areas of the cerebellar cortex, and to which Thomas has called attention in man. It is a matter on which a definite opinion cannot be passed without careful deliberation, since it is by more or less indirect means only that such changes as Thomas has described can be detected, but even by employing Thomas's own methods I have been unable to confirm his conclusions. The significance from this point of view of two well-recognised clinical phenomena, spontaneous deviation in Bárány's pointing tests, and excess of movement in certain directions will be considered later.

Occurrence of Hypotonia.

Though some degree of hypotonia can be detected in probably all cases of local injury which present obvious symptoms, it must be admitted that it is not demonstrable in all affections of the cerebellum. I have seen a few warfare injuries in which no trace of hypotonia could be detected, but the number was small. That the cerebellum was injured in these cases was proved either by operative exploration or by radiographic examination of the skull. On the other hand, deficiency of tone, as far as we can judge from our methods of investigating it, is certainly not constant in the primary cerebellar atrophies; Babinski and others have denied its occurrence in such cases. This may be due to the gradual compensation or recovery that occurs *pari passu* with the slow progress of the disease, or to the coincident involvement of other parts of the nervous system that may have an influence on the tonic mechanisms, for in the cerebellar atrophies the disease is rarely limited to the cerebellum.

Purely cortical lesions of the cerebellum can undoubtedly disturb muscle tone; this is made certain by its occurrence in many of my cases with superficial lesions, in all of which it is impossible to assume that the central nuclei were also damaged. This experience conforms to many experimental observations in which hypotonia was observed after destruction of the cortex, though Rothmann failed to detect it after decortication of one lateral lobe, and therefore concluded that it occurs only when the central nuclei are damaged. That atonia is then a more prominent symptom there can be no doubt; the deeper and larger the lesion the greater and more permanent is the deficiency of tone. But this fact cannot be regarded as evidence that it is chiefly the central nuclei that contain the cerebellar tonic mechanisms, since all the efferent cerebellar paths, and consequently those through which alone the cerebellum can influence tone, pass through these nuclei.

Lesions of both the lateral lobes and vermis have the same effect on tone, but when the latter is involved the disturbances are more prominent in the trunk than in the limbs. As I have had no case in which the disease was limited to the vermis I am unable to say if it is merely on the musculature of the trunk that this exerts its influence.

Appearance of Atonia.

A diminution of tone appears almost immediately, or at least very rapidly after the occurrence of an acute destructive lesion of the cerebellum. I have observed it within a few hours of a gunshot wound and of a softening, and have seen a great increase of hypotonicity immediately after recovery from the anæsthetic in a patient in whom it was necessary to excise a portion of the cerebellum in the removal of a tumour. The flaccidity of the muscles, as tested by clinical methods, increases, however, during the first week or ten days after the onset of the lesion, the limbs becoming more flail-like on handling and the elasticity of their muscles diminishing, but the change is rarely great.

The persistence of hypotonia depends largely on the site and severity of the lesion. When this is small and superficial the muscles may regain an apparently normal condition within a few weeks as the other symptoms pass off, but when the destruction is more extensive the loss of tone may persist as a permanent phenomenon; I have observed it two and three years after apparently small gunshot wounds, and several years after the removal of cerebellar tumours.

Lesions involving the inferior cerebellar peduncles and the efferent cerebellar connexions passing through Deiter's nucleus, certainly produce a loss of tone in man, and it is probable that injuries of the middle peduncles may have a similar effect. There are, however, many facts that suggest that destruction of the superior cerebellar peduncles may have a different influence on muscle tone. The fact that the transection of the brain-stem which produces decerebrate rigidity, a state which is the paradigm of postural tone, divides either them or their mesencephalic connexions, suggests that the cerebellar impulses which pass by them may be inhibitory of tone rather than tone-exciting. The stiff hypertonic state of the musculature of one side of the body when one superior peduncle is destroyed in man, or when its termination in the red nucleus is injured by such lesions as produce Benedict's syndrome, point to the same conclusion. Unfortunately, Ferrier's classical experiments on the superior peduncles throw no light on this matter, and, as far as I am aware, the condition of tone has not been carefully investigated in other such experiments. In two of my cases in which one superior peduncle was damaged, in one by a tumour and in the other

by a softening, there was hypotonicity rather than atonicity of the homolateral musculature.

A series of other symptoms of cerebellar disease which can be attributed directly to disturbances of tone, may be most conveniently considered here before we deal with the irregularities of active movement.

ATTITUDE.

The abnormal attitudes assumed by animals after experimentally produced lesions of the cerebellum have attracted much attention, but these are rarely prominent symptoms in man, and when they occur, it is often impossible to exclude the influence of concomitant affections of the vestibular nerves or of their central connexions. The importance of the labyrinths in determining attitudes of the body and of its parts is well known, and has acquired a special significance since the investigations of Magnus and de Kleijn and their pupils have shown that a number of reflex attitudes can be excited from them, and the importance of these reflexes in the adjustment of the body in equilibrium and in motion. These workers have, however, demonstrated that these tonic labyrinthine reflexes persist unchanged after removal of the cerebellum, which cannot therefore be regarded as their reflex centre. There can be, however, no doubt that pure cerebellar lesions may produce abnormal attitudes which can be most easily explained by disturbances in the tone of those muscles which acting normally together preserve natural postures.

We have already seen that owing to the tonelessness of their muscles the limbs may assume strange attitudes when lying passive, and that even when held in position by volitional effort certain of their segments may droop under the influence of gravity or other forces. These are usually the only postural abnormalities they present. The only two frequent exceptions are a tendency for the outstretched arm to swing in that direction in which it deviates in the pointing test, and abduction and outward rotation of the affected leg in standing. As the latter is usually observed only when the patient is erect on his feet, it may be attributed to an attempt to compensate his instability, while the spontaneous deviation of the arm can scarcely be regarded as a disturbance of an attitude, since it occurs under certain conditions only, and has not a constant influence on the posture of the limb. Occasionally there is some inward rotation of the arm with pronation of the forearm, or outward rotation at the shoulder, but these attitudes frequently vary from day to day and may alternate. It is, however, common to see the shoulder of the affected side depressed and often lying in front of the opposite one; this attitude is certainly due to passive displacement by the weight of the limb, the hypotonic muscles failing to counteract the influence of gravity. It sometimes happens that the affected shoulder is the higher, but this is common only when the patient is sitting, or when he makes a voluntary attempt to overcome the tendency to incline to the affected side.

Special attitudes of the trunk are more common. They are rarely observed when the patient is lying supine and fully supported, but even then the vertebral column is sometimes concave to the affected side, especially in recent and severe injuries. On standing this curvature of the spine is more pronounced, and is often associated with a slight rotation, the homolateral shoulder being carried forwards. These attitudes can be explained by the unequal distribution of tone in the muscles of the two sides of the body. The effect of hypotonia of the trunk muscles is most obvious in cases of severe bilateral injury. One man with such a lesion was noted to "fit into any attitude into which he was put"; as he sat on a chair unsupported, he usually inclined forward and developed an extraordinary degree of antero-posterior curvature, or he might incline to either side until arrested by some support.

The typical position of the head in cerebellar disease has given rise to some controversy. My cases of gunshot injury can scarcely be used as an argument in favour of any of the opinions expressed, for, in the first place, the damage to the muscles inserted into the base of the skull, either by the original wound or by the subsequent operations, must have exerted some influence on it; and in the second, each patient naturally kept his head in the position in which the damaged tissues were most relaxed, and the discomfort of the wound or injury least troublesome. There is, however, a general tendency in unilateral cerebellar injuries for the head to flex to the homolateral side and rotate so that the chin is carried towards the opposite shoulder. It is, however, doubtful if this is a true cerebellar attitude; Horsley has attributed it to vestibular disturbances, and it is noteworthy that it was pronounced in my six cases of tumour in the cerebello-pontine angle, most of which probably originated from, and all of which injured, the vestibular nerve.

From these observations the conclusion is justified that abnormal attitudes assumed by the trunk or limbs are due either to the passive displacement of hypotonic parts by external forces, or to an unequal distribution of tone such as occurs in the trunk muscles as a result of unilateral cerebellar lesions.

ASSOCIATED MOVEMENTS.

The excessive associated movements that frequently develop in the homolateral limbs on strong muscular effort of either an opposite limb or the other limb of the same side, can be also explained by defective postural fixation of the affected parts. In certain cases, particularly in those with considerable disturbance of tone, these associated movements are very vigorous and wild. When, for instance, one patient with an extensive wound of the left side of the cerebellum grasped a dynamometer strongly with his right hand, his left arm became rigid, all the muscles of the arm and forearm stood out in firm contraction, the thumb straightened out, the fingers flexed at the proximal and extended at their interphalangeal joints, the elbow extended, and the arm was abducted and rotated outwards at the shoulder. At the same time the left knee and thigh flexed so that the foot was raised and drawn under the chair in which he was sitting. There seems to be no constancy in the type of these associated movements; they vary from patient to patient and often in the same patient from day to day. They are more intermittent, more clonic, and more irregular than those which occur in spastic conditions, and usually require more effort to evoke them. Further, they subside more abruptly when the effort that has excited them ceases.

Normal limbs have a tendency to develop such associated movements, distinguished by their apparent purposeless and by their slow tonic character, on strong innervation of the muscles of some other limb, but their excursions are restricted by the tone that fixes them in their natural postures. When this postural tone is deficient the limb or any of its parts is displaced excessively by the shortening of those muscles that contract, or rather, by predominance of contractions in certain muscles or groups of muscles. The excess of associated movements in cerebellar disease is consequently another manifestation of deficient tone.

THE REFLEXES.

It is generally stated that the reflexes are unaffected by lesions of the cerebellum, but a careful study usually reveals certain changes in the tendon-jerks that are more or less characteristic. I have detected no abnormalities in the cutaneous or superficial reflexes, but after acute and extensive lesions there may be a less brisk withdrawal of the homolateral foot on stimulation of the sole, or the withdrawal movement may be more irregular and unrestrained than in the normal limb; the plantar reflexes, however, are invariably of the normal type, and the abdominal and cremasteric remain unchanged.

The alterations in the tendon-reflexes can be best studied in the knee-jerk. For some time after the

occurrence of an acute unilateral lesion the homolateral jerk is often depressed or difficult to elicit, or a response may be obtained from one or two only of a series of taps on the patellar tendon, though the range of the jerk when it occurs is usually large and ample. It was generally in patients with large infected gunshot wounds that the jerks were absent or much depressed, and in such cases it is impossible to ascribe the change to destruction of the cerebellum only. I have, however, found the jerks also diminished after extensive operation wounds and within a few days of the occurrence of a vascular lesion of the cerebellum, but as this diminution persists for a short time only it may be regarded as an effect of "shock."

When the patellar tendon is tapped as the patient sits on a high stool so that his legs can swing freely, the response of the affected limb lacks the decisive, forcible character of the normal jerk, though its range may be as large or even greater. But the most characteristic change is that while the normal leg (Fig. 1A) comes quickly to rest on falling to its original position, the affected limb (Fig. 1B) continues to swing

FIG. 1A. FIG. 1B.

Tracings of the excursion of the leg in a normal (A) and in a cerebellar (B) knee-jerk, recorded on a slowly revolving drum. Three normal jerks are shown in 1A, and two cerebellar jerks in 1B.

inertly like a pendulum, oscillating to and fro around its position of rest. The jerk has, therefore, the pendular character described by Thomas. A similar pendular jerk can be obtained in the upper limb if, while the elbow is flexed to a right angle and the forearm hangs vertically, either the tendon of the triceps muscle or the lower end of the radius is tapped; then the forearm continues to swing to and fro after the reflex contraction has ceased.

It will be remembered that Sherrington has shown that the knee-jerk, and the same must hold for the other tendon-jerks, consists of a simple twitch contraction to which there is added a plastic shortening reaction persisting after the twitch has ceased. The initial twitch contraction is generally unaffected by lesions limited to the cerebellum; to it is due brisk extension of the leg. Under normal conditions the leg in falling again to the vertical under the influence of gravity is restrained by the after-shortening of the quadriceps, and its fall is consequently less rapid and abrupt than that of a pendulum or an inert body, and its momentum on reaching the vertical is therefore not sufficient to make it swing beyond it. Further, oscillations are also checked by the plastic tone of both extensor and flexor muscles. When, however, the extensors of the knee lack their plastic tone the leg, after being extended by the twitch contraction, drops unimpeded and swings to and fro. Sherrington has described this type of knee-jerk in states where the reflex excitability of postural contraction is low, "the relaxation fall of the curve is full, drops to the zero abscissa freely and is usually followed by some pendular oscillations."

That this is the explanation of the pendular jerk in cerebellar disease can be easily proved by myogram tracings of the contraction of the quadriceps muscle in the jerk. The normal curve (Fig. 2A) shows a definite plateau, or a second rise corresponding to the appearance of after-shortening, which is absent in the cerebellar patient where the tracing (Fig. 2B) is identical with that of a simple twitch. Tracings of the reflex contractions of other muscles excited in the same manner as the gastrocnemius, biceps, triceps, and hamstrings, show identical abnormalities.

It must be, however, pointed out that the pendular jerk is not pathognomonic of cerebellar disease; it is occasionally found in persons in apparently normal health, and it is common in hypotonic states, as in early tabes when these reflexes are not abolished. There is frequently another abnormal feature in the knee-jerk of the affected side. If the observer places a hand across the hamstring tendons behind the normal knee he can generally feel a brisk tightening of them at a short interval of time after the patellar tendon has been struck, provided this excites a jerk of sufficient range. Palpation of the flexor muscles shows that this tightening of the tendons is due to their active contraction, and not merely to passive stretching by the extension of the knee. On the affected side no such contraction of the hamstrings may be felt, no matter in what position the knee is placed, or how great the amplitude of the jerk. The result of this is that if the two limbs are fully supported on the bed with the hips and knees semi-flexed and the thighs rotated outwards so that the heels are at the same level, the foot of the unaffected side, after moving abruptly towards the bottom of the

FIG. 2A.

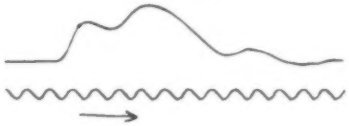
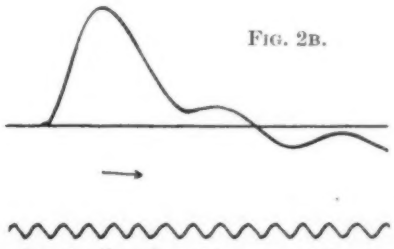


FIG. 2B.



Myogram of contraction of quadriceps muscle in normal knee-jerk (A) and in cerebellar disease (B). Time by tuning-fork of 25 vibrations a second.

bed by each jerk elicited by a tap on the patellar tendon, tends to return immediately to its original position, while on the affected side the foot generally remains in the position into which it has been moved by the contraction of the quadriceps, and the knee can be consequently fully extended by a series of taps.

We cannot, however, assume that the failure of the hamstrings to contract in cerebellar disease is due to their inexcitability, for this can be shown to exist by other means, as by a sudden blow on their tendons. The probable explanation is that in the absence of postural tone the tension within the muscles is insufficient to permit their end-organs being adequately stimulated by that degree of stretching which normally evokes a reflex contraction. This explanation would also account for the difficulty sometimes experienced in states of marked cerebellar atonia, in eliciting the knee-jerk and other reflexes by a gentle tap.

STATIC TREMOR.

As tremor in portions of the body that are not fully supported can be attributed to disturbance of muscle tone it can be most conveniently considered here. But all tremors occurring in cerebellar disease are not of the same nature.

If a patient with a unilateral lesion holds both arms extended horizontally in front of him, or raises his lower extremities from the couch on which he lies, the limb of the affected side may at first maintain its attitude as steadily as its fellow. Indeed, for a time it may appear even more steady, since the fine vibratory tremor that is commonly observable in the normal arm when it is extended rigidly is often absent in the

affected limb. But as the muscles holding the limb up begin to tire an irregular tremor develops. Its oscillations are mostly in the line of gravity, and can be seen on careful inspection to be due to a failure in the tonic contractions of the muscles that maintain the attitude, with the result that the limb falls with gravity and is replaced by voluntary efforts. This form of tremor may occur at any joint, but it is more common at the proximal. It is frequently seen in the head too when the patient is in such a position that muscular effort is necessary to fix it. In cases with bilateral lesions of the cerebellum a similar tremor of the whole body may be seen when the patient stands erect.

In all these instances the unsteadiness of the trunk or limbs is obviously due to failure of those muscles that should fix the attitude to remain in a state of steady tonic contraction.

Another type of tremor, characterised by more regular oscillations of a limb or some of its segments, occurs when the patient attempts to maintain the limb accurately in certain positions, or in postures necessary for the performance of some act. On holding his finger near to, but not in contact with, the tip of his nose or some other point, or his heel above, but not actually touching, his opposite knee, a tremor may develop that is sometimes so regular in rate and range as to resemble that of paralysis agitans. This form of tremor is frequently seen too when the patient employs tools that require delicacy and precision; on attempting to write the point of the pen may oscillate from side to side, or swing around in irregular circles before it reaches the paper; and on beginning to sharpen a pencil the hand that holds the knife may swing to and fro until the blade touches the pencil, then it ceases, or is replaced by the more irregular jerks that disturb voluntary movement.

It is usually only in attitudes determined by the tonic contractions of opposing groups of muscles that this regular form of tremor develops; in other words, only when both the agonists and their opponents are both contracted. A limb can be maintained in any position by the action of the anti-gravity muscles only, but if it is required that the fingers shall be held steadily, 1 mm., for example, from the tip of the nose, other muscles, or perhaps all those of the limb, contract tonically in order to assure the accuracy of the fixation. This can be ascertained by handling or palpating the limb, particularly if a special effort is necessary owing to it being unsteady. But this tonic contraction of the opposing muscles is no longer required when the finger comes in contact with the nose, or the pen with the paper, or the blade of the knife with the pencil; then the action of the prime movers against the resistance of the object touched is sufficient, and then this regular tremor usually ceases.

The oscillatory tremor that occurs in these circumstances can be attributed to alternate contractions of certain groups of muscles and their antagonists. This is probably due to the loss of postural tone, the failure of fixation by muscles that move the joint in one direction allowing their contracting antagonists to displace it in the opposite sense, and as these do not immediately adapt their length to the fixation of the limb in its new posture, it is again moved by the opposing muscles towards and beyond its original position. Consequently, the part oscillates around the position it should occupy.

A similar regular tremor occurs more rarely in portions of the body which are not fully supported. The affected arm of one of my patients always developed a tremor, regular in rate and amplitude and of about four oscillations a second, when it fell over the arm of a chair on which he sat; and in another an identical tremor was seen in the leg when it hung over the edge of the bed. It is more common in the head than in the limbs. Its resemblance to the tremor of paralysis agitans is unmistakable; it is apparently similar to that which Ferrier and Turner observed after section of the superior peduncles, and which is frequently associated with mid-brain lesions that involve these peduncles. In my only two cases of gunshot wounds in which it was a prominent feature, the course or position of the missiles made it probable that the superior peduncles were injured. It occurred also in a man lately under my observation in whom an extensive tumour was found by the operation to extend towards the anterior margin of the cerebellum, where it probably involved one superior peduncle.

THE REBOUND PHENOMENON.

Another symptom frequently found in cerebellar disease, which shows a further rôle probably played by muscle tone, is the rebound phenomenon.

If the resistance that effectively prevents a movement of a normal limb in response to a strong voluntary effort be suddenly released, the limb, after moving a short distance in the desired direction, is arrested abruptly by the action of the antagonist muscles, or it may even jerk back or rebound. This sudden arrest fails frequently in cerebellar disease. It can be demonstrated at most joints of the limbs, but is most conveniently examined at the elbow. The arm is preferably supported and the patient is asked to pull his hand towards his mouth against the resistance offered by the observer who grasps his wrist; when the grasp is suddenly relaxed the hand of the affected side swings violently towards his face or shoulder, and if the limb be very hypotonic, the elbow may be at the same time jerked off its support with the result that the arm may be flung above his head. Similarly, if the string by which he attempts to raise a weight be unexpectedly cut, the arm flies upwards, unchecked by the antagonists. There is often a corresponding inability to arrest passive movements quickly; the affected hand, for example, can be often thrown violently against the patient's face, as though the limb were paralysed or an inert body, in a manner which is never possible on the normal side.

Several factors must be considered in attempting to explain the failure of the antagonists to check active and passive movements of the limb promptly. If we assume that the arrest is brought about by their voluntary contraction, it might result from either defect or delay in this. But it appears doubtful if it is effected only by a voluntary contraction, and even though this does take a part it may be that the deficiency of tone in the opposing muscles prevents them from withstanding the sudden strain to which they are subjected by the momentum of the moving limb. It is, however, more probable that a contraction of the antagonists, sufficient not merely to arrest the limb, but also adapted to fix it in its new attitude, is normally assured by some subcortical reflex mechanism in which the cerebellum, owing to its importance in the postural functions, takes an important part. The contraction of the flexors of the knee normally excited by a brisk knee-jerk, which may be absent in cerebellar disease, is an allied phenomenon, and there can be no doubt that it is produced reflexly.

BRITISH ORTHOPÆDIC ASSOCIATION.—The summer meeting of the British Orthopædic Association was held on May 26th and 27th at Sir William Treloar's Hospital for Crippled Children at Alton and at its annexe at Hayling Island. On the opening day at Alton a lantern-slide demonstration was first given, showing in general the methods of treatment in the hospital, and a kinematograph of the application of a high plaster jacket. The College, in which the technical training of crippled boys between the ages of 14 and 18 is carried out, was then inspected. The principal trades taught are leather bag, case, and trunk-making, tailoring, and boot-making and repairing. A series of cases illustrating mechanical methods of treatment of spinal caries and hip disease was shown in the afternoon. On the second day the Association paid a visit to Hayling Island, where treatment by fresh air, sunlight, and sea bathing was illustrated, and Prof. Leonard Hill gave a short lecture on the physiological effects of sunlight. Sir Robert Jones, the President, and about 40 members and visitors attended the meeting.

THE BACTERIAL ORIGIN OF DENTAL CARIES.

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ALTHOUGH dental caries is a widespread and almost universal disease, at the present moment little is definitely known of the causal agent or agents. Of the many theories propounded perhaps the parasitic theory has received most support. The modern or chemoparasitic conception of this theory originated with Miller's[1] brilliant researches on the subject from 1880 to 1890; he regarded acids produced by the fermentation of carbohydrates by bacteria as the primary factor. As bacteriology at that time was in its early stages, knowledge and technique were not sufficiently advanced to identify and isolate bacteria found, and much of his work was therefore of a morphological character. Yet this work into the histology of the process of dental caries is regarded as a classic on the subject.

Since Miller's time a number of researches have shown that a large variety of bacteria are to be found in the mouth and in dental caries. With regard to dental caries, Goadby[2] described some 18 types which he subdivided into acid-producing types and dentine liquefiers. Kligler[3] identified 10 different groups. Howe[4] considers two types of bacteria grouped by him under the name Moro-Tissier are most frequently present in dental caries. These investigations, however, have been described as researches into the bacterial associations of dental caries.

In natural caries the pathological process is well understood, the condition usually beginning on the crown and particularly in the fissures and at points of contact between the teeth. Macroscopically, the first sign is the appearance of a small chalk-white area on the enamel. The process continues, the enamel prisms break down and are removed. The dentine is now attacked and it, like the enamel, is decalcified and destroyed until the tooth pulp is reached. In the affected dentine bacteria (bacilli, cocci, &c.) can be demonstrated with considerable ease.

The constant presence of bacteria even in the deeper layers of carious dentine suggested to us that it was unlikely that all the bacteria were merely secondary invaders in already damaged tissues. But the variety of micro-organisms present, together with the results of former investigators, convinced us that it would be necessary to employ some selective method of isolation. As the first stage in dental caries is a destruction of the enamel by decalcification, it was considered that if bacteria play an important rôle in the ætiology, they must be capable of bringing about such a change. This necessitates that the bacteria can produce sufficient acid to bring about decalcification.

The selective technique we proposed to use was a very acid medium, as it was reasonable to suppose that bacteria which can produce a high concentration of acid are also capable of living in a very acid medium. By the use of this medium we succeeded, as the following results show, in killing off or inhibiting most of the contaminating bacteria leaving us with a certain type of microbe which we regard as the chief ætiological agent in dental caries.

Technique of Isolation.

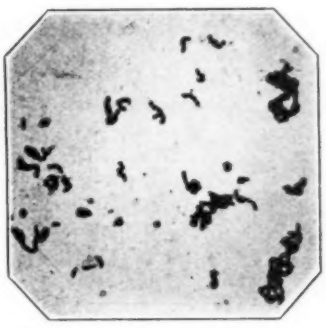
The first procedure was to determine experimentally the degree of acidity required to decalcify enamel. Normal teeth—i.e., teeth showing no caries—were placed in acid broths of different pH values from 5 to 1, and after autoclaving, left for 34 weeks. At the end of this time the degree of whitening or opacity of the enamel was noted, and it was found that a greater degree of acidity than pH 4 was necessary to attack the enamel.

Carious teeth were obtained from the dental out-patient department and from two private practices in order to procure material from a wide source. After passing the tooth through the flame the superficial part of the carious material was removed with a sterile scalpel, and the deeper part taken and emulsified in broth pH 7·6. After 24 hours' incubation broths of varying degrees of acidity were heavily inoculated, and from these agar-plates were inoculated after 24 or 48 hours. At first the acid broths used varied from pH 7 to pH 4·5, and later higher concentrations up to pH 1 were tried. After a short time the most successful method was found to be to emulsify the carious material in pH 3·5 broth direct, as in this the majority of organisms from the tooth fail to grow.

FIG. 1.

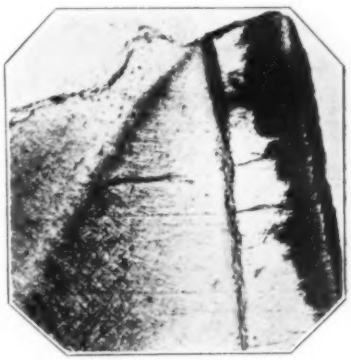
Type I. bacillus—smear preparation from agar-slope culture showing palisade and chain formation. (Gram. × 1200 diam.)

FIG. 2.



Type II. bacillus—smear preparation from agar-slope culture. (Gram. × 1200 diam.)

FIG. 3.



Ground section showing caries of the enamel and organisms passing along the amelo-dentinal junction. (× 30.)

Nature of the Organisms Isolated.

The organisms isolated by the above method fall, morphologically, into the main groups: (*a*) Type I., a long thin bacillus 0·75 × 2–3 μ, which occurs singly, in pairs or chains, having a marked tendency to parallelism or palisade formation in dried films

(Fig. 1): in old cultures chains are not formed; (*b*) Type II., a shorter bacillus 0·75 × 1–2*μ*, usually occurring in chains (Fig. 2). Both organisms are non-motile and Gram-positive; both are aerobes and facultative anaerobes. In broth there is usually uniform turbidity, but in a few cases the growth settles to the bottom. On ordinary agar the colonies may appear as minute points after 24 hours' incubation, but often do not become visible till after 48 hours; they are small, round, greyish and opaque, with a finely granular appearance and a regular outline under the low power. The colonies are about 0·5–1·0 mm. in diameter; on serum agar rather larger, up to 2·0 mm. When first isolated the organisms tend to die out rapidly and should be subcultured once a fortnight; later once a month is sufficient.

Type I. was isolated in pure culture from the deeper layers of carious dentine from 38 out of 50 teeth and Type II. from 18 out of 50 teeth. In some cases the growth of mouth organisms in the original broth culture outgrew the above two types so that they were not isolated, although morphologically similar organisms were seen in films—inoculation into acid broth direct obviates this difficulty. Including these cases, Type I. "occurred" in 44 cases, and Type II. in 21 cases. One or other or both types were isolated in pure culture from 88 per cent. of cases and "occurred" in 96 per cent. Occasionally other organisms were isolated, but with no regularity.

FIG. 4.

Caries of the enamel showing undermining and zone of decalcification. (× 30.)

Relation of the Two Types to Other Bacteria Described in Dental Caries.

Morphologically, Type I. closely resembles an organism illustrated by Miller [1] in a microphotograph of artificial caries; *B. acidophilus* (Moro) as described by Howe [4] also bears some resemblance, but the sugar reactions differ as he states that most strains ferment saccharose. Kligler [3] isolated 58 strains of *B. acidophilus* (Moro) from the teeth.

Decalcification.

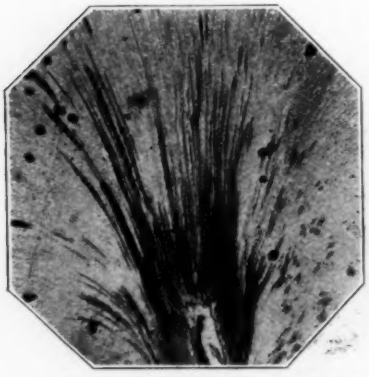
It was found experimentally that a degree of acidity greater than pH 4·0 was required to decalcify enamel. It was therefore necessary to determine whether the bacilli isolated by us were able to form this amount of acid from carbohydrates. Nine strains picked at random were inoculated into glucose broth of a reaction of pH 7·6 and incubated till the growth had completely sedimented. The average reaction gave a pH value of 2·75; so far we have not met with any other bacteria either in the mouth or elsewhere which can produce such an extreme degree of acidity. A seven days' old culture of *B. coli* in glucose broth gave a final pH value of 4·0.

Production of Artificial Caries.

In estimating the ætiological importance of a virus it is necessary to judge the effects of the virus or, better still, of pure cultures on the normal tissues, as pathological changes comparable with those found in the spontaneous affection should follow the application of the proper ætiological agent. In the case of teeth the problem is complicated by their peculiar composition, necessitating a prolonged experimentation. The experiments described here were all done in vitro, full details of which are given in our paper in the *British Journal of Experimental Pathology*.[5]

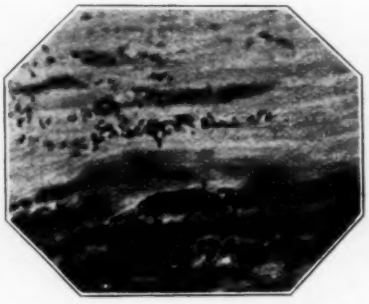
Non-carious teeth were placed in glucose broth and sterilised; various strains of the bacilli were then inoculated into the broth; control inoculations were made with *Streptococcus salivarius* and *B. coli*. Every eight days the teeth were removed from the culture and placed in fresh uninoculated glucose broth under sterile conditions, so as to prevent the

FIG. 5.



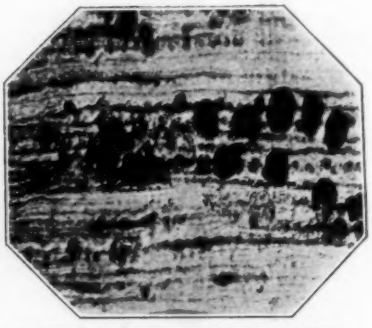
Low-power magnification of artificial caries; organisms in the dentinal tubules and liquefaction foci. (Beck 1 in.)

FIG. 6.



High-power magnification of artificial caries; organisms in the dentinal tubules. (Beck 1/12 in. oil imm.)

FIG. 7.



Artificial caries; organisms in dentinal tubules and liquefaction foci. (× 260.)

In Table A of the sugar reactions of the two types isolated, it is seen that Type I. is very constant, whereas Type II. is very variable. In no case was gelatin liquefied or indol formed; 26 strains were inoculated into dextrin and dulcite without the formation of acid or gas.

Agglutination.

The agglutinating power of the two types in two immune sera prepared from Type I. is shown in Table B.

Both types of organism are included in Table B, but in each case the strains agglutinated in the higher dilutions belonged to Type I. In no instance was any Type II. strain agglutinated in a higher dilution than 1/160.

TABLE A.—*Sugar Reactions of the Two Types Isolated.*

Glucose.	Lactose.	Saccharose.	Milk.	Gelatin.	Indol.	No. of strains.
Type I.						
Ac.	Ac.	0	AcCl.	0	0	33/38
Ac.	Ac.	Ac.	0	0	0	2/38
Ac.	0	Ac.	Ac.	0	0	1/38
Ac.	0	Ac.	0	0	0	1/38
Ac.	0	0	0	0	0	1/38
Type II.						
Ac.	Ac.	Ac.	AcCl.	0	0	7/18
Ac.	Ac.	Ac.	Ac.	0	0	3/18
Ac.	Ac.	Ac.	0	0	0	2/18
Ac.	Ac.	0	Ac.	0	0	1/18
Ac.	0	Ac.	0	0	0	2/18
Ac.	0	0	AcCl.	0	0	1/18
Ac.	0	0	Ac.	0	0	1/18
Ac.	0	0	0	0	0	1/18

TABLE B.—*Agglutinating Power of the Two Types.*

Serum.	No. of strains put up.	1/40	1/80	1/160	1/320	1/640	1/1280	1/2560
A.	16	16	15	12	12	10	8	9
B.	14	14	14	13	8	5	5	6

teeth remaining continuously in an acid medium in which the bacteria soon die. Sufficient bacilli were carried over on each tooth to inoculate the fresh broth.

The primary lesion observed in our experiments is a whitish opacity of the enamel similar to that of "natural caries"; the change is not uniform in that in some areas the penetration is more marked than in others. (Figs. 3 and 4.) Sections show a granularity of the enamel prisms and fragmentation, but bacteria so far have not been definitely demonstrated in the enamel, nor have they in "natural" caries. Decalcification of the enamel, however, and the passage of micro-organisms along the amelo-dentinal junction can be seen in Figs. 3 and 4. Miller noted that the first change in the dentine was an area of decalcification in advance of the organisms; Fig. 4 is from a section in which the infected dentine has taken the stain more deeply than the decalcified dentine while the undecalcified parts are unstained. Microscopically, the organisms are found to spread down the dentinal tubules in a manner identical with the natural process. (Fig. 6.) There is also a true widening of the tubules and the formation of liquefaction foci. (Fig. 7.)

Fig. 5 shows a low-power magnification of a longitudinal section from a tooth, the upper half of which had been in a glucose-broth culture of Type I. for 17½ weeks. The organisms have penetrated the dentinal tubules *from the pulp cavity side*, which fact proves that the appearance is artificial; since natural caries always starts from the enamel side. In some of the more recent artificial caries results still more comparable to true caries have been produced. These, along with the effects of the cultures on living teeth, we propose to give in a future communication.

Conclusions.

1. The examination of selected carious material showed the constant presence of a definite type of bacilli.

2. These bacilli are capable of forming a high degree of acidity by the fermentation of carbohydrates.

3. Teeth left in contact with cultures over prolonged periods showed changes almost identical with "natural" caries: erosion of the enamel, penetration of the dentinal tubules, and the formation of liquefaction foci.

4. These bacilli in their resistance to and formation of acid resemble the acidophilus group of Moro; biologically, however, there are several points of difference. To the bacilli we propose to give the name *B. acidophilus odontolyticus*, Type I. and II.

5. The successful production of artificial caries by pure cultures of the organisms isolated goes far in establishing the microbic theory of caries.

Finally, we wish to express our indebtedness to Mr. J. Howard Mummery for the great trouble he has taken in the preparation of the sections in Figs. 3 and 4, and to Mr. J. Q. Rowett, who has generously defrayed a large part of the expenses of this research.

References.—1. Miller, W. D.: The Micro-Organisms of the Human Mouth, 1890. 2. Goadby, K.: The Mycology of the Mouth, 1903. 3. Kligler, I. J.: Jour. Allied Dent. Soc., N.Y., 1915, x., 141, 282, 445. 4. Howe, P., and Hatch, Ruth: Dental Cosmos., Phila., 1917, lix, 961. 5. McIntosh, J., James, W. Warwick, Lazarus-Barlow, P.: Brit. J. Exp. Path., 1922, iii., 138.

RESEARCHES ON YELLOW FEVER.

COMPARATIVE ÆTIOLOGICAL, PATHOLOGICAL, AND EPIDEMIOLOGICAL CONSIDERATIONS; PREVENTION AND TREATMENT.

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Yellow fever, once the horror of settlers and travellers along the coasts of the Americas, has been reduced to a rank of secondary importance among infectious diseases. Earlier observers disputed over the nature of the dreaded *vomito negro*, but finally agreed that it was non-contagious. About the middle of the nineteenth century Beauperthuy[1] announced his suspicion that mosquitoes carried the virus from man to man. Finlay,[2] in 1881, specifically accused the *Stegomyia calopus* of being the particular variety of mosquito which acted as intermediary host, and Finlay's theory finally received substantial corroboration at the hands of the American commission—Reed, Carroll, Lazear, and Agramonte—in Cuba in 1899 and 1900,[3] when Sternberg, who had contributed so much to the knowledge of yellow fever, was Surgeon-General. The fundamental facts established by the American commission and confirmed subsequently by Guiteras,[4] Marchoux, Salimbeni, and Simond,[5] Rosenau and Goldberger,[6] Rosenau, Parker, Francis, and Beyer,[7] were: (1) That yellow fever is transmitted to non-immune persons by means of the bite of infected stegomyias or by direct injection of the blood of yellow fever patients; (2) that the yellow fever virus is present in the blood during the first three days of the disease; (3) that the fomites are not infectious; (4) that the virus is a filter-passer; and (5) that the mosquitoes which have fed on yellow fever patients do not become infective until after about 12 days (in a tropical climate).

The length of the "extrinsic incubation period," which had already been deduced by Carter[8] from epidemiological data, suggested that the virus of yellow fever might be of non-bacterial origin. Schaudinn,[9] Novy,[10] and Marchoux[11] had prophesied that it would be a spirochæta, and Stimson,[12] in 1907, demonstrated a spirochæta in a Levaditi preparation of kidney obtained at autopsy from a case of yellow fever.

Although no organism was found by the American commission, the practical knowledge obtained made possible the eradication of the disease from some of the most formidable endemic centres. The work of Gorgas, Carter, and Guiteras in Cuba and Panama, Boyce in the West Indies, Lyster in Central America, Connor in Guayaquil, Hanson in Peru, and Oswaldo Cruz in Brazil, bears sufficient evidence of the effectiveness of the anti-stegomyia measures. No other infectious disease has been so thoroughly placed under human control as has yellow fever since the discovery of the rôle of the stegomyia as intermediary host. In the early days of stegomyia control petroleum was employed as a larvacide, but certain small fish are now employed with equal success and less expense (Connor).

Discovery of the Causative Microbe.

Notwithstanding the unparalleled triumph of anti-stegomyia campaigns, the causative microbe of yellow fever continued to evade detection until the summer of 1918, when a commission was sent to Guayaquil, Ecuador, by the International Health Board of the Rockefeller Foundation, for renewed study of the disease; the work on ætiology being undertaken by the writer. The findings have already been reported in detail elsewhere, and the reader is referred to these sources.[13] Briefly, the following facts were brought to light:—

(1) Injection of the blood of yellow fever patients into young guinea-pigs produced in 25 per cent. of instances a symptom-complex of fever, jaundice, and nephritis, and hæmorrhages into the gastro-intestinal tract as well as into various other visceral organs. The course of the experimental infection was much the same as that of human yellow fever.

(2) In the blood and organs, particularly the liver and kidney, of the infected guinea-pigs a minute, actively motile, ultramicroscopic organism, subsequently designated *Leptospira icteroides*, was demonstrated both in fresh and stained preparations. Pure cultures of the organism were obtained from the infected animals as well as from human cases. Direct microscopic detection of *Leptospira icteroides* in human blood and organ emulsions occurred only in a few instances, and even in the materials from experimental animals microscopic demonstration was inconstantly successful, notwithstanding subsequent proof of the infectiousness of the material. *Leptospira icteroides* was found to be a filter-passer, and a single infection with the organism proved to confer lasting immunity, as does yellow fever in human beings.

(3) The immune substance was found to be present in varying degrees in the blood of individuals convalescent from yellow fever, as demonstrated by the Pfeiffer phenomenon. It was similarly demonstrated in the blood of animals which had recovered from the experimental infection.

(4) Female stegomyia mosquitoes were found to become infectious about 12 days (in one instance as early as eight days), after having fed upon the blood of yellow fever patients or experimentally infected guinea-pigs. *Leptospira icteroides* was demonstrated under the darkfield microscope in the emulsions of the infective insects, and the injection of these materials into guinea-pigs produced a typical infection.

(5) The pulse-rate in the experimental animals became relatively slow after the first few days, the well-known Faget's sign of human yellow fever being thus reproduced.

Transmission Experiments.

During 1919, 1920, and 1921, several expeditions were sent out for further study. In Mérida, Yucatan, and in northern Peru, Kligler and the writer obtained results similar to those in Guayaquil[14]; in Piura Gastiaburu transmitted the disease to guinea-pigs; in Veracruz first Perez-Grovas,[15] later Le Blanc, and still later Iglesias transmitted yellow fever to guinea-pigs, and in some instances obtained cultures of *Leptospira icteroides*. Iglesias also transmitted the disease from animal to animal by means of experimentally infected stegomyia mosquitoes in two experiments of a large series, once 23 days and in another instance 31 days after the mosquitoes had been fed.

The question naturally arises why previous investigators had failed in an undertaking seemingly so simple as the transmission experiments. In the first place, it must be emphasised that guinea-pigs are by no means uniformly susceptible. On the contrary, some, especially older animals or those reared in tropical countries, are almost always insusceptible, as shown by Kligler and the writer.[14] Among other animals, young dogs and marmosets are the only ones which can be infected with massive doses of material from experimentally infected animals. Furthermore, the earlier literature on yellow fever shows very little systematic effort on a large scale to transmit the disease into animals, and when done it was seldom with blood from the early stage of the disease, but usually with black vomit or gastro-intestinal contents, heart blood or organs obtained at autopsy. Experiments carried out after the discovery of the American commission that the virus existed in the blood circulation only during the first three days of the disease were comparatively few, but the results are more significant. For example, Wolferstan Thomas[16] succeeded in producing yellow fever symptoms in chimpanzees and guinea-pigs in 1909. Seidelin,[17] who conducted more extensive series of transmission experiments in guinea-pigs, seems to have transmitted the disease to this species and maintained a long series of passages. In the protocols of these authors, however, no mention is made of definite jaundice. It is not improbable, as Dr. Seidelin personally wrote the writer recently, that they may have been dealing with the leptospira infection without knowing it. While having the highest respect for the work of Seidelin and others, the writer did not attempt to pursue their investigations, being confronted almost immediately with a definite micro-organism absolutely impossible to confuse with any other elements previously described.

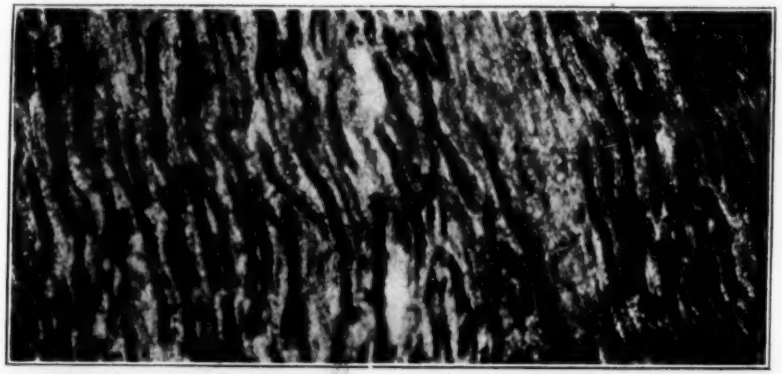
Relation of Yellow Fever to Infectious Jaundice.

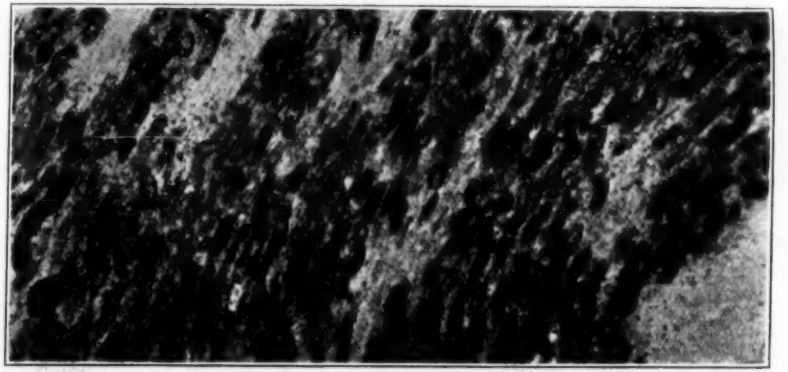
The morphological features of *Leptospira icteroides* are almost indistinguishable from those of *Leptospira icterohæmorrhagiæ* or *Leptospira hebdomadis*,[18] or for that matter from certain non-pathogenic leptospiras recently found by Miss Evelyn B. Tilden, and the writer in stagnant fresh and salt water in various localities in the United States.[19] Yet the pathogenic varieties are by no means identical, as has been shown by immunological as well as pathological properties. The *icteroides* is predominantly icteronephritic, with marked tendency to produce fatty degeneration of the parenchymatous cells of the liver and kidney; the hæmorrhage in the mucous membranes is more marked in experimental *icteroides* infection than in the experimental infectious jaundice. In the *hebdomadis* infection there is only slight tendency to jaundice, or none at all. In the human disease also the differences are chiefly of degree. For example, yellow fever is in general more rapid in evolution and higher in mortality than infectious jaundice, which in turn is a much severer infection than the non-fatal seven-day fever of Japan. While a typical case of yellow fever is not readily confused with typical infectious jaundice, yet there are many border-line cases, in which careful epidemiological considerations alone may decide the diagnosis. A severe case of infectious jaundice, with "black vomit" and cardinal symptoms, jaundice, nephritis, nervous symptoms, relative brachycardia, cannot be clinically differentiated from yellow fever of similar severity. In such cases of infectious jaundice the boxwood liver, famous in connexion with yellow fever, may also be found at autopsy (Valassopoulo[20] in Egyptian cases). Moreover, these changes have been reported by Noc and Nogue[21] in diseases other than yellow fever. The diagnosis of yellow fever cannot be made by the presence of black vomit and boxwood colour of the liver alone, for both may be absent in certain undoubted yellow fever cases. Attention should also be called to the close resemblance of mild cases of yellow fever and infectious jaundice. Most of the yellow fever cases experimentally produced by the American Commission in Cuba, in 1899–1900, might easily have been mistaken for mild infectious jaundice if they had occurred spontaneously. Hence, as Ryle[22] pointed out, and as is well supported also by the case reports of Dawson, Hume, and Bedson,[23] and of Gwyn,[24] the two diseases are essentially similar. Before Valassopoulo and Martin and Pettit demonstrated the identity of the mild and severe types of bilious typhoid fever of Egypt by means of the Pfeiffer reaction,[25] the severe type was regarded as more akin to yellow fever than to the average mild type of infectious jaundice. Similar confusion prevailed in Japan, where, for some time previous to the discovery by Inada and Ido of the spirochætal nature of infectious jaundice, severe cases in the sub-tropical zone of Japan were mistaken for yellow fever. Careful comparison of the leucocytic formulæ in the two diseases shows that slight leucocytosis is usual in infectious jaundice, while in yellow fever the leucocytes are but little increased, while the differential counts in the two diseases are similar.

PLATE I.—Dr. Noguchi: YELLOW FEVER KIDNEY IN MAN AND ANIMALS SHOWING FATTY DEGENERATION.

HUMAN CASES.

EXPERIMENTAL INFECTION with *Leptospira icteroides*.





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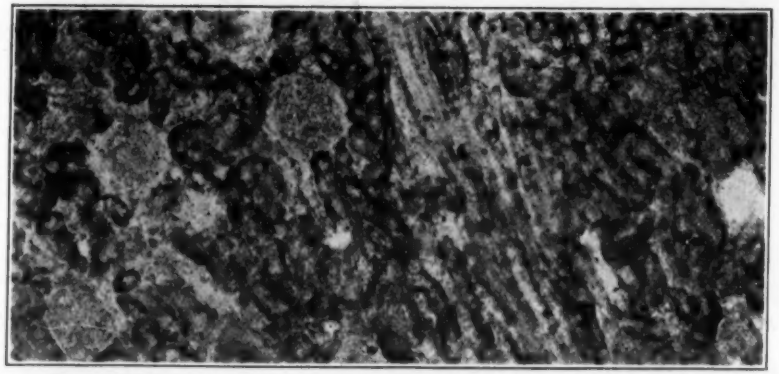

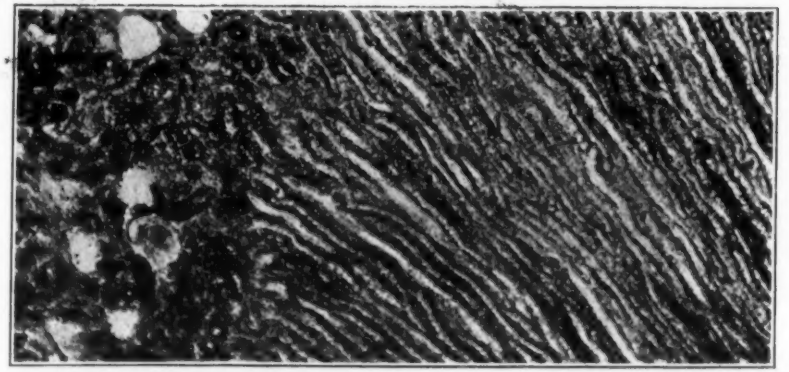

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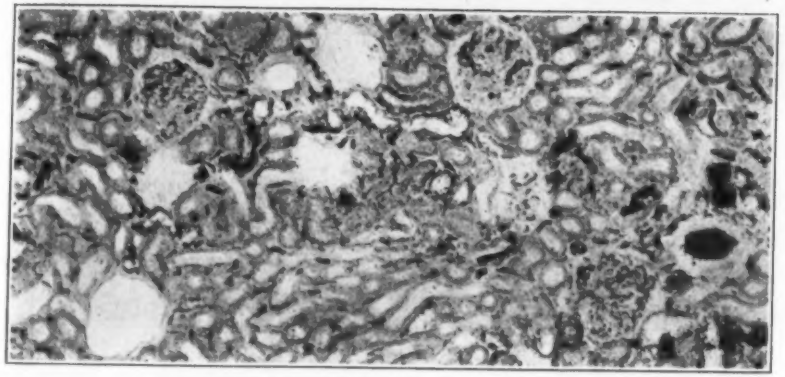
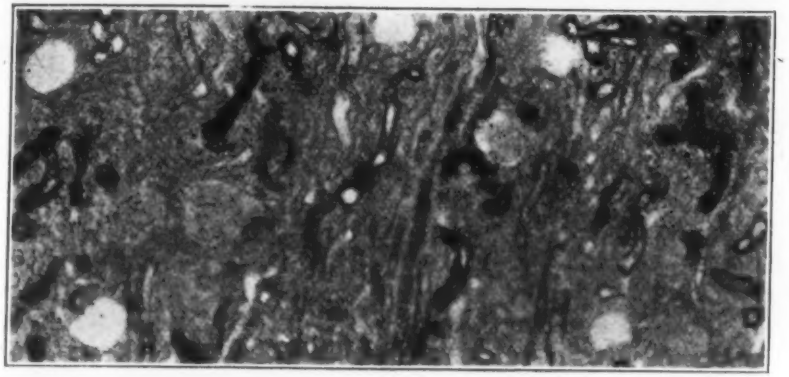




DOG.

(Plates I., II., and III. stained with Scarlet R. Magnification about 50 diameters.)

Discovery of the Causative Microbe.

Notwithstanding the unparalleled triumph of anti-stegomyia campaigns, the causative microbe of yellow fever continued to evade detection until the summer of 1918, when a commission was sent to Guayaquil, Ecuador, by the International Health Board of the Rockefeller Foundation, for renewed study of the disease; the work on ætiology being undertaken by the writer. The findings have already been reported in detail elsewhere, and the reader is referred to these sources.[13] Briefly, the following facts were brought to light:—

(1) Injection of the blood of yellow fever patients into young guinea-pigs produced in 25 per cent. of instances a symptom-complex of fever, jaundice, and nephritis, and hæmorrhages into the gastro-intestinal tract as well as into various other visceral organs. The course of the experimental infection was much the same as that of human yellow fever.

(2) In the blood and organs, particularly the liver and kidney, of the infected guinea-pigs a minute, actively motile, ultramicroscopic organism, subsequently designated *Leptospira icteroides*, was demonstrated both in fresh and stained preparations. Pure cultures of the organism were obtained from the infected animals as well as from human cases. Direct microscopic detection of *Leptospira icteroides* in human blood and organ emulsions occurred only in a few instances, and even in the materials from experimental animals microscopic demonstration was inconstantly successful, notwithstanding subsequent proof of the infectiousness of the material. *Leptospira icteroides* was found to be a filter-passer, and a single infection with the organism proved to confer lasting immunity, as does yellow fever in human beings.

(3) The immune substance was found to be present in varying degrees in the blood of individuals convalescent from yellow fever, as demonstrated by the Pfeiffer phenomenon. It was similarly demonstrated in the blood of animals which had recovered from the experimental infection.

(4) Female stegomyia mosquitoes were found to become infectious about 12 days (in one instance as early as eight days), after having fed upon the blood of yellow fever patients or experimentally infected guinea-pigs. *Leptospira icteroides* was demonstrated under the darkfield microscope in the emulsions of the infective insects, and the injection of these materials into guinea-pigs produced a typical infection.

(5) The pulse-rate in the experimental animals became relatively slow after the first few days, the well-known Faget's sign of human yellow fever being thus reproduced.

Transmission Experiments.

During 1919, 1920, and 1921, several expeditions were sent out for further study. In Mérida, Yucatan, and in northern Peru, Kligler and the writer obtained results similar to those in Guayaquil[14]; in Piura Gastiaburu transmitted the disease to guinea-pigs; in Veracruz first Perez-Grovas,[15] later Le Blanc, and still later Iglesias transmitted yellow fever to guinea-pigs, and in some instances obtained cultures of *Leptospira icteroides*. Iglesias also transmitted the disease from animal to animal by means of experimentally infected stegomyia mosquitoes in two experiments of a large series, once 23 days and in another instance 31 days after the mosquitoes had been fed.

The question naturally arises why previous investigators had failed in an undertaking seemingly so simple as the transmission experiments. In the first place, it must be emphasised that guinea-pigs are by no means uniformly susceptible. On the contrary, some, especially older animals or those reared in tropical countries, are almost always insusceptible, as shown by Kligler and the writer.[14] Among other animals, young dogs and marmosets are the only ones which can be infected with massive doses of material from experimentally infected animals. Furthermore, the earlier literature on yellow fever shows very little systematic effort on a large scale to transmit the disease into animals, and when done it was seldom with blood from the early stage of the disease, but usually with black vomit or gastro-intestinal contents, heart blood or organs obtained at autopsy. Experiments carried out after the discovery of the American commission that the virus existed in the blood circulation only during the first three days of the disease were comparatively few, but the results are more significant. For example, Wolferstan Thomas[16] succeeded in producing yellow fever symptoms in chimpanzees and guinea-pigs in 1909. Seidelin,[17] who conducted more extensive series of transmission experiments in guinea-pigs, seems to have transmitted the disease to this species and maintained a long series of passages. In the protocols of these authors, however, no mention is made of definite jaundice. It is not improbable, as Dr. Seidelin personally wrote the writer recently, that they may have been dealing with the leptospira infection without knowing it. While having the highest respect for the work of Seidelin and others, the writer did not attempt to pursue their investigations, being confronted almost immediately with a definite micro-organism absolutely impossible to confuse with any other elements previously described.

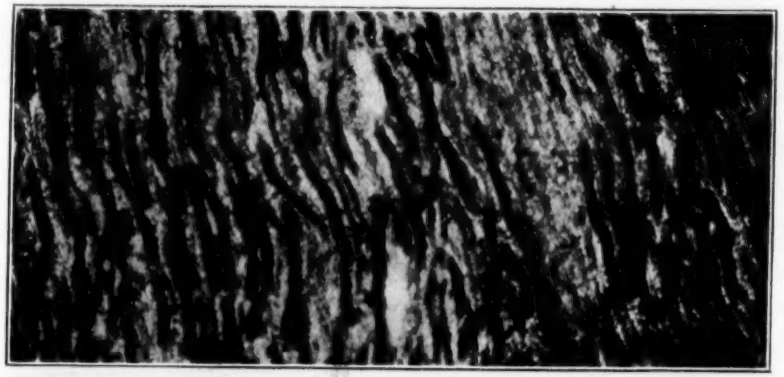
Relation of Yellow Fever to Infectious Jaundice.

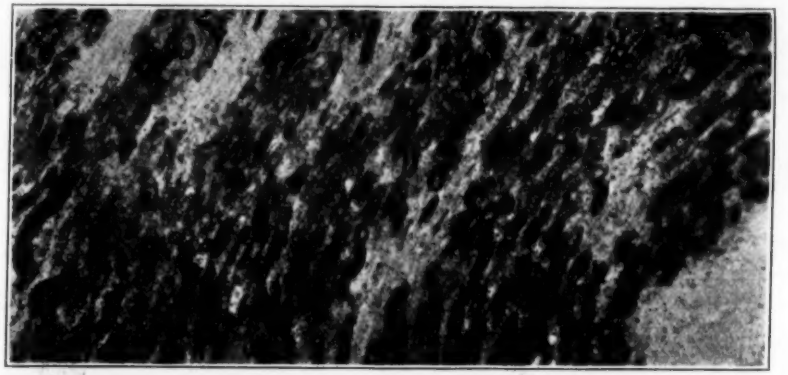
The morphological features of *Leptospira icteroides* are almost indistinguishable from those of *Leptospira icterohæmorrhagiæ* or *Leptospira hebdomadis*,[18] or for that matter from certain non-pathogenic leptospiras recently found by Miss Evelyn B. Tilden, and the writer in stagnant fresh and salt water in various localities in the United States.[19] Yet the pathogenic varieties are by no means identical, as has been shown by immunological as well as pathological properties. The *icteroides* is predominantly icteronephritic, with marked tendency to produce fatty degeneration of the parenchymatous cells of the liver and kidney; the hæmorrhage in the mucous membranes is more marked in experimental *icteroides* infection than in the experimental infectious jaundice. In the *hebdomadis* infection there is only slight tendency to jaundice, or none at all. In the human disease also the differences are chiefly of degree. For example, yellow fever is in general more rapid in evolution and higher in mortality than infectious jaundice, which in turn is a much severer infection than the non-fatal seven-day fever of Japan. While a typical case of yellow fever is not readily confused with typical infectious jaundice, yet there are many border-line cases, in which careful epidemiological considerations alone may decide the diagnosis. A severe case of infectious jaundice, with "black vomit" and cardinal symptoms, jaundice, nephritis, nervous symptoms, relative brachycardia, cannot be clinically differentiated from yellow fever of similar severity. In such cases of infectious jaundice the boxwood liver, famous in connexion with yellow fever, may also be found at autopsy (Valassopoulo[20] in Egyptian cases). Moreover, these changes have been reported by Noc and Nogue[21] in diseases other than yellow fever. The diagnosis of yellow fever cannot be made by the presence of black vomit and boxwood colour of the liver alone, for both may be absent in certain undoubted yellow fever cases. Attention should also be called to the close resemblance of mild cases of yellow fever and infectious jaundice. Most of the yellow fever cases experimentally produced by the American Commission in Cuba, in 1899–1900, might easily have been mistaken for mild infectious jaundice if they had occurred spontaneously. Hence, as Ryle[22] pointed out, and as is well supported also by the case reports of Dawson, Hume, and Bedson,[23] and of Gwyn,[24] the two diseases are essentially similar. Before Valassopoulo and Martin and Pettit demonstrated the identity of the mild and severe types of bilious typhoid fever of Egypt by means of the Pfeiffer reaction,[25] the severe type was regarded as more akin to yellow fever than to the average mild type of infectious jaundice. Similar confusion prevailed in Japan, where, for some time previous to the discovery by Inada and Ido of the spirochætal nature of infectious jaundice, severe cases in the sub-tropical zone of Japan were mistaken for yellow fever. Careful comparison of the leucocytic formulæ in the two diseases shows that slight leucocytosis is usual in infectious jaundice, while in yellow fever the leucocytes are but little increased, while the differential counts in the two diseases are similar.

PLATE I.—Dr. Noguchi: YELLOW FEVER KIDNEY IN MAN AND ANIMALS SHOWING FATTY DEGENERATION.

HUMAN CASES.

EXPERIMENTAL INFECTION with *Leptospira icteroides*.





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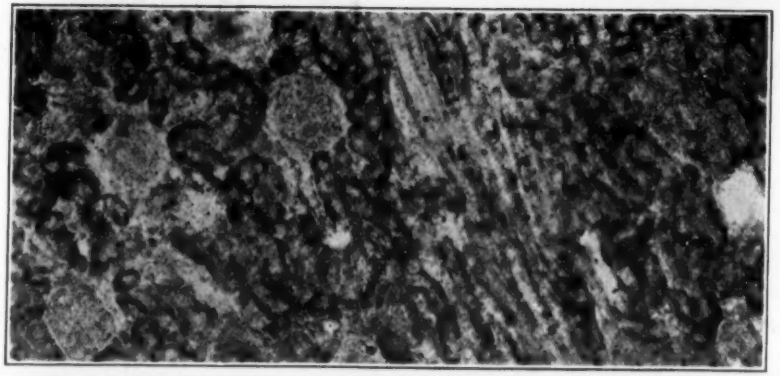

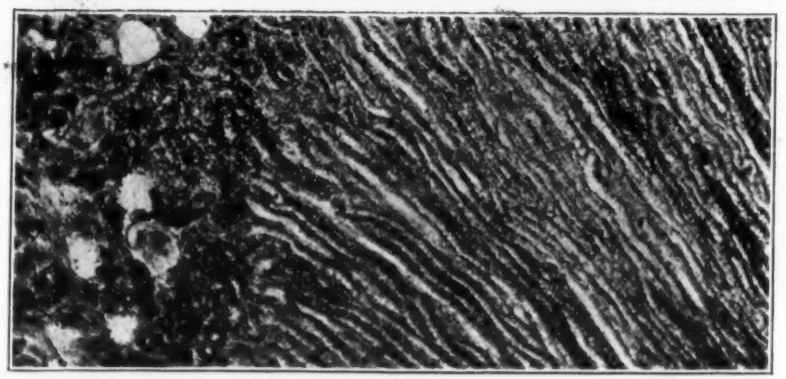

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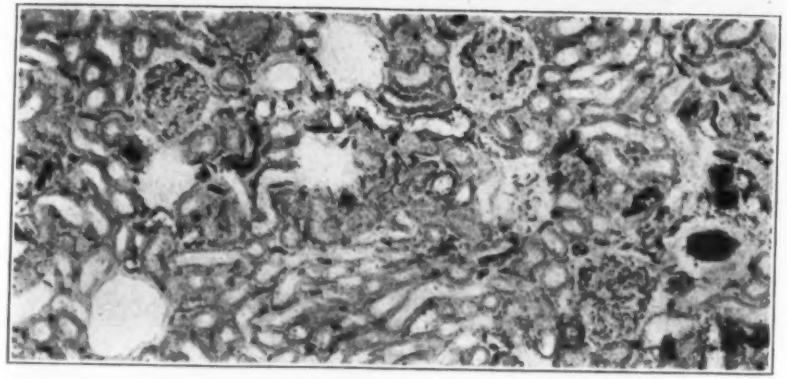

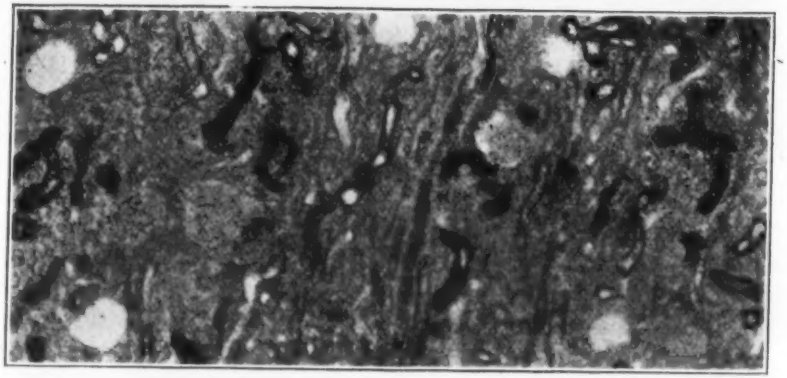

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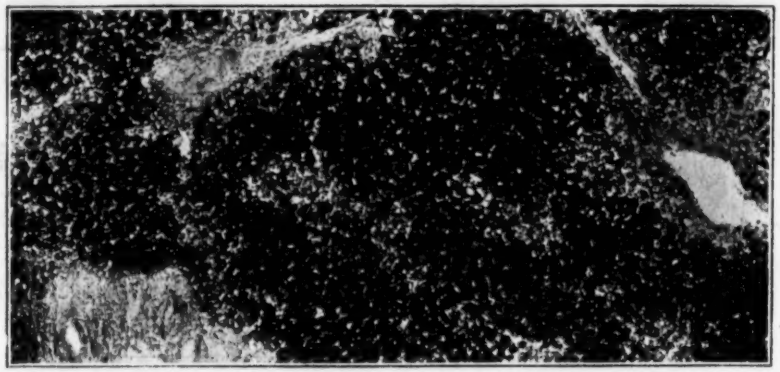
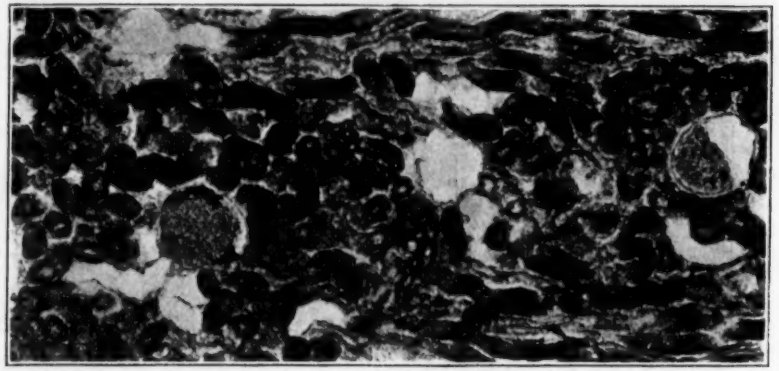
(Plates I., II., and III. stained with Scarlet R. Magnification about 50 diameters.)

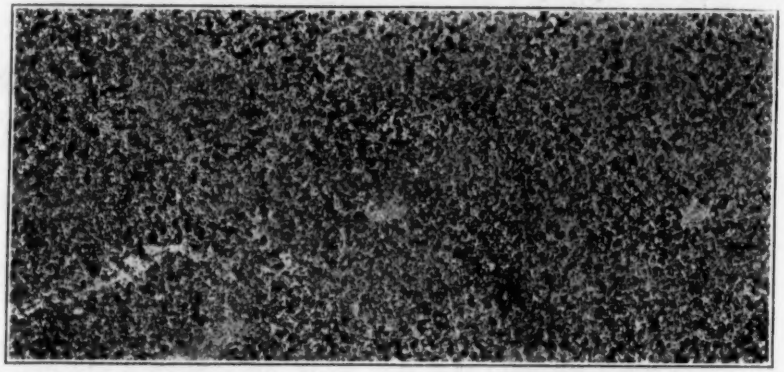
PLATE II.—Dr. Noguchi: COMPARISON OF FATTY DEGENERATION IN HUMAN LIVER AND KIDNEY.

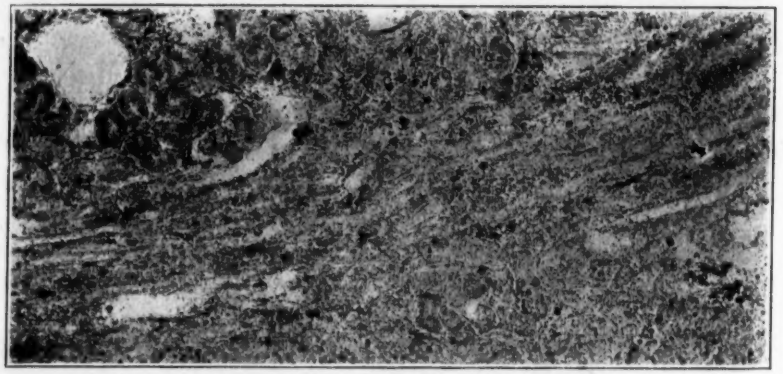
LIVER. YELLOW FEVER. KIDNEY.



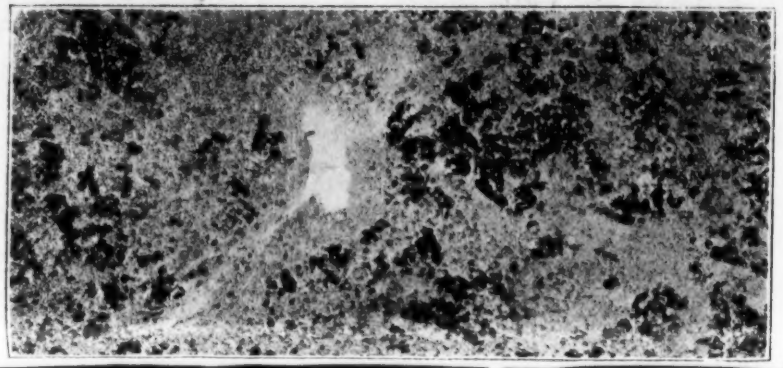


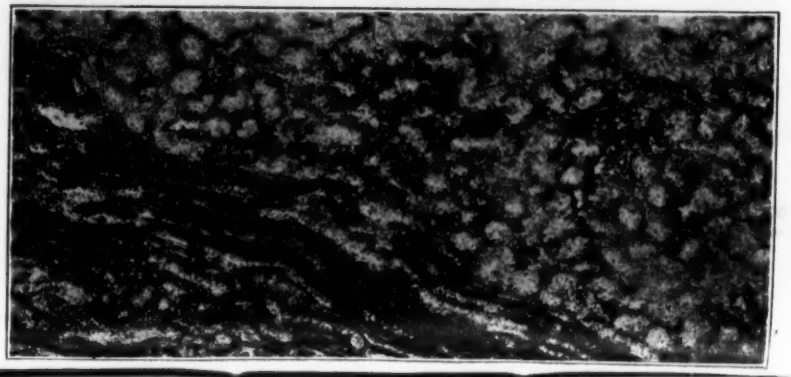
WEIL'S DISEASE.





ACUTE YELLOW ATROPHY.





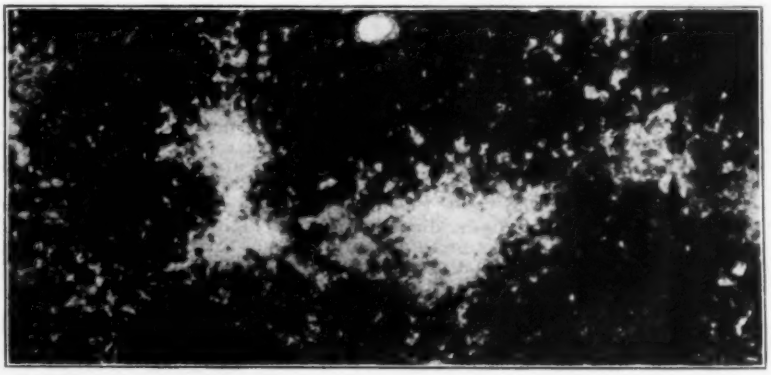
Elliott[26] and others encountered marked leucocytosis in some cases of yellow fever.

The foregoing discussion is introduced here to enable us to visualise yellow fever and infectious jaundice, which are produced by two distinct but closely related species of the genus leptospira, just as yaws, syphilis, and rabbit venereal disease are three different diseases caused by three morphologically indistinguishable but distinct species of the genus treponema.

Fatty Degeneration.

The fatty degeneration of the liver and kidney in human yellow fever and in experimental animals has been briefly alluded to. That there exists complete agreement in degree and distribution of fatty degeneration in animals and in man affords further evidence that *Leptospira icteroides* is the cause of yellow fever. As might be expected, the degree and distribution of fatty degeneration depends upon how much each particular organ has been involved, and this condition is variable from case to case. In severe degeneration the entire parenchyma of the liver appears fatty in sections (Plate II., Fig. 1), in others the distribution is irregular or confined to the peripheral portions of the acini. The same is true in experimental animals. The tubules of the kidney are more affected than the glomeruli (Plate I., left-hand figures). The renal epithelia are fatty and necrotic, and the lumen is filled with amorphous material or cellular casts. The kidney changes in experimental animals are similar (Plate I., right-hand figures).

PLATE III.—PHOSPHORUS POISONING (?). FATTY DEGENERATION IN HUMAN LIVER.



In human as well as experimental infectious jaundice the fatty degeneration of the liver and kidneys is much less marked. Specimens of liver and kidney from five cases of infectious jaundice in Japan[27] showed in only one instance fatty changes in the liver comparable with the milder type of liver changes in yellow fever. For comparison low-power photographs of the sections of liver and kidneys from yellow fever, infectious jaundice, acute yellow atrophy of the liver (Plate II.), and a case of possible phosphorus poisoning in a child (Plate III.), are presented. Fatty degeneration is seen to be most complete in the phosphorus poisoning (?) sections; it decreases progressively in intensity in acute yellow atrophy, yellow fever, and infectious jaundice in the order named.

Effect of Passages on Virulence.

My attention was recently attracted to a peculiar fact with regard to the reactions of guinea-pigs and dogs in an unbroken series of passages of *Leptospira icteroides*. The animals become less jaundiced, the liver less fatty, the kidneys and other tissues more hæmorrhagic, and finally death occurs with a veritable leptospiræmia. The picture in such animals is quite unlike that found in animals inoculated with a strain freshly isolated from human cases or one passed through a few generations on the leptospira medium after passage through animals. Under natural conditions *Leptospira icteroides* never passes directly from man to man, but only, so far as we know, through the medium of the mosquito, *Stegomyia calopus*, in the body of which it remains for many days as though in cultures, hence its characteristic pathogenicity is maintained. If yellow fever were transmitted directly from man to man in an unbroken series of passages the clinical picture might be a different one.

The demonstration of the susceptibility of guinea-pigs, puppies, and marmosets to *Leptospira icteroides* does not in any way modify our present-day conception of yellow fever epidemiology. In the first place, these animals can be infected only with difficulty under the most favourable experimental conditions. Guinea-pigs and monkeys are occasionally inhabitants in human dwellings, puppies more commonly, but the susceptibility of the latter is such as to require an enormous amount of infected materials from experimental animals, a circumstance never occurring in nature. Adult dogs of various breeds have been experimentally inoculated with *Leptospira icteroides* in its most virulent forms and in large quantities, but repeated efforts to produce infection have failed.[28] Under the circumstances these animals can hardly become reservoirs of yellow fever infection, as an indefinite series of transmission from these relatively resistant animals to the stegomyia and from the latter back to the former is out of the question. Should occasional transmission from a yellow fever patient to one of these animals take place, the animal might theoretically become a source of danger, but to assume such a possibility in reality is rather far-fetched. In Guayaquil, however, guinea-pigs are forbidden in the city by order of the Department of Health, because of the fear that they may spread plague.

Prophylactic Inoculation and Serum Therapy.

Assuming that the *Leptospira icteroides* is the incitant of yellow fever on the basis of the findings described, the next step was to determine whether the cultures of this organism could be utilised for the purpose of protecting non-immune human beings by prophylactic inoculation or for the production of sufficiently potent immune serum for the treatment of yellow fever patients. For complete eradication of yellow fever the anti-stegomyia campaign is the ultimate measure to be relied upon, but there are at times local circumstances which render impossible the effective enforcement of sanitary measures. Furthermore, in a community where a case of yellow fever has broken out, prompt vaccination of the total non-immune population, carried out, if possible, simultaneously with the anti-stegomyia measures, may serve to check further spread of the diseases by setting up what Lyster and Carter have called a "barrage" of vaccination. The use of immune serum in cases of yellow fever would be a considerable advance in our present knowledge of treatment of that disease, as so far no specific remedy has been found. The wise physician sees to it that the patient is not moved, receives no food and plenty of water. This principle of treatment has been called by Carter the tripod on which the treatment of yellow fever rests.[29]

Preliminary experiments in animals, carried out soon after the isolation of *Leptospira icteroides* in

1918, showed that one or two subcutaneous inoculations of killed cultures of the organism render guinea-pigs immune for a period of about six months.[30] Highly potent immune sera were also prepared in horses by immunising them with the live cultures for periods of months or years. The titre of the serum reached a point at which 1 c.cm. neutralised about 5,000,000 minimum lethal doses of *Leptospira icteroides*, and it was found that guinea-pigs experimentally infected with several hundred lethal doses can be saved from death when a sufficiently large quantity of the serum (e.g., 0·01 to 0·1 c.cm.) is administered within three to four days after the onset of symptoms.[31] When administered during the incubation period the serum altogether prevents the development of any infection. Hence there was ample reason for trying the prophylactic vaccination and serum treatment in human beings.

Practical application of the preventive vaccination with the killed cultures of *Leptospira icteroides* was first undertaken by Dr. Pareja and the writer [30] in Quito in non-immune soldiers who, after a second vaccination, were sent down to Guayaquil, where yellow fever was still prevalent (1918). Other soldiers and numbers of civilians were subsequently vaccinated (1919). Among the vaccinated the case-incidence was about 11 per 1000, while among the non-vaccinated it was about 110 per 1000. The concentration of the vaccine was afterwards increased many hundredfold, and trial was continued under the direction of Dr. Theodore C. Lyster, of the International Health Board of the Rockefeller Foundation. Lyster, Vaughn, Bailey, and the departments of public health of Mexiço, Salvador, Guatemala, British Honduras, and adjacent countries vaccinated during the years 1920 and 1921 about 10,000 non-immune individuals residing in the infected areas of these countries.[32] The reports show that none of the individuals who received two injections of 2 c.cm. of the vaccine contracted yellow fever, while a few of those who received a single injection became infected later. Comparison of these figures with the number of cases which developed among the non-vaccinated population during the same periods and in corresponding localities was so striking that the protective value of the vaccine seems conclusively proven. It has also been brought out that the vaccinated individuals are perhaps as susceptible as the unvaccinated during the first 10 or 15 days following the last injection. The protection becomes effective only after the lapse of that period, which undoubtedly is that required for the development of immunity in the body of the vaccinated individual.

Results in Peruvian Epidemic.

In 1921 Peru suffered from the visitation of a tremendous yellow fever epidemic, in which 15,000 cases of the disease were reported. This epidemic was successfully checked and stamped out by a vigorous anti-stegomyia campaign under the direction of Dr. Henry Hanson.[33] A strong prejudice on the part of the native population prevented the use of the vaccine and serum extensively, but a few interesting observations on their value were made by Hanson. Dr. Joseph H. White, assistant surgeon-general of the U.S. Public Health Service, who witnessed the Peruvian campaign, reports that in one instance 50 non-immune soldiers, 25 of whom had been vaccinated, were stationed in the villages where the epidemic of yellow fever was at its height. Of the 25 non-vaccinated soldiers, 20 contracted the disease, while none of the 25 vaccinated came down. On another occasion Hanson reports having vaccinated 200 soldiers who were non-immune so far as could be determined. These soldiers were quartered in an infected town without the occurrence of a single case of yellow fever among them. A similar observation was recently reported by Surgeon-General Osornio,[32] of the Mexican Army, who sent 600 vaccinated soldiers to Manzanillo, a Pacific port of about 3000 inhabitants, where yellow fever had been occurring among the inhabitants of the town for some time. Notwithstanding free intercourse between the soldiers and the native inhabitants, no case of yellow fever developed among the former, although the disease continued to occur among the latter.

In Belize, British Honduras, an epidemic of yellow fever broke out in St. John's College, where nine cases occurred among 146 students. The entire college population was subsequently vaccinated. Seven more cases appeared among them within 1 to 14 days—that is, before protection had time to develop—some of the individuals apparently having been in the incubation period when the vaccine was administered. No further case occurred. In this instance the check of the epidemic may have been partly due to eradication of the infected mosquitoes, but Dr. Gann, who was the medical officer in charge, is inclined to attribute the success to prompt vaccination.

With regard to the effect of the anti-icteroides immune serum upon human cases of yellow fever, we are in possession of the following data. The serum was first used by Lyster and Pareja during their tour of Central American countries in 1919 in two cases, an American marine on the U.S.S. *Chicago*, and the Mexican Minister to Nicaragua. The diagnosis was made by the commission under General Gorgas, who was also present. One case was treated on the fourth day, the other patient had been ill only a short time when treated, and both recovered. The commission regarded the serum as of decided therapeutic value and recommended further trial. Subsequent observations now total 187 cases, treated at different stages of the disease, and are very encouraging.[32] Of 107 cases treated before or on the third day of disease, only 14 have died. On the other hand, the mortality among those treated after the fourth day has been almost as high as among those who did not receive any serum. Speaking in terms of percentages, early treatment has reduced the mortality of yellow fever from 52 per cent. to 13 per cent. The beneficial effect of the serum, however, does not lie only in lowering the death-rate, but also in rapid alleviation of subjective as well as objective clinical symptoms, as has been emphasised by Lyster, Pareja, Vaughn, Bailey, Le Blanc, Kligler, Caballero, and others who have employed the serum in various epidemics.

Yellow fever is no longer an actual menace to those countries where modern sanitary organisation makes it impossible for *Stegomyia calopus* to thrive in large numbers, and where every precaution and emergency measure are provided in case of introduction of infected mosquitoes, but there still exist many parts of the world where climatic, economic, and other conditions are less favourable to carrying out the anti-stegomyia campaign. In such localities prophylactic vaccination may be of practical value, at least until civilisation finally conquers all these natural obstacles.

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(*Continued at foot of next page.*)

ACUTE SUPPURATION OF THE MIDDLE EAR:
EARLY DRAINAGE OF THE MASTOID ANTRUM.

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A CONVICTION that in many cases of acute suppuration of the middle ear simple incision of the membrana tympani (paracentesis) followed by the instillation of antiseptic solutions into the external meatus is an incomplete and unsatisfactory method of combating a serious infection, has led me during the last three or four years to try the effect of quite early drainage of the mastoid antrum and with satisfactory results. It must be borne in mind, however, to begin with, that there are many cases where simple paracentesis gives so immediate and so striking a relief to the pyrexia, pain, and tympano-meatal œdema that the question of further operation never arises; just as every practitioner knows that in the majority of cases of acute suppuration of the middle ear spontaneous rupture of the abscess through the membrane is followed in three or four days by cessation of discharge and restoration of hearing without any special treatment whatever. Again, there are other cases in which, although drainage through the membrane is instituted either naturally or by art, the pyrexia, pain, and other symptoms continue, and it is then a well-established rule in otology to open the antrum without undue delay. My remarks in the present paper have nothing to do with either of those two well-defined groups.

Cases with Discharge Persisting after Treatment.

There is a third class of case, by no means uncommon, in which acute symptoms decline and disappear after the onset of discharge, but in which the discharge itself persists in spite of meatal treatment. These cases tend to end in chronic suppuration, and may lead later on not only to serious deafness but to the formation of cholesteatoma, and perhaps also to grave complications. Nevertheless, even chronic suppuration frequently yields to meatal treatment, by antiseptic applications, by ionisation, or otherwise. That fact is undeniable. But until the discharge does dry up the patient is running a serious risk both as regards his hearing and as regards his life; and I think this risk is unnecessary, since most of these cases can be quite easily and promptly cured by early posterior drainage—that is to say, by the opening and draining of the mastoid antrum and of the mastoid cells, if cells are present, through a post-aural incision.

Time of Operation.

As to the date at which this simple operation should be undertaken we must necessarily be guided by the particular features in each individual case. Sometimes it is unwise to delay longer than a week, at other times one may wait for a fortnight or even three weeks without danger. Personally, I prefer not to postpone the operation, even in apparently mild cases, for more than 10 days after the membrane has ruptured or has been incised. It is, of course, true that we may not receive a case so early as this, and we have still to estimate the chances of success or failure when we operate at dates much later than those mentioned above. I cannot yet give any reliable information as to these chances, but I have repeatedly operated with success on ears which have been discharging for periods of six or eight weeks; in two or three cases the operation was successful even as late as three months from the onset of the disease. On the other hand, I have recently had a failure in a case of two months' duration. On general grounds it is probably safe to say that the longer the operation is delayed the less likely is it to be successful.

The reason for adopting the practice of early drainage of the mastoid antrum may be briefly expressed as follows. Purulent discharge indicates septic infection, and we should try to cut short the existence of infection in and about the middle ear by every available means and at the earliest possible moment.

Posterior Drainage Prior to Meatal Drainage.

I have opened and drained the mastoid antrum at all stages in the course of the disease. One had to ascertain what was the most favourable moment for intervention. First, under the influence of the idea that any breach of the membrana tympani should, if possible, be avoided, I tried to forestall that event, when the opportunity presented itself, by opening the mastoid antrum in acute suppuration of the middle ear with a bulging membrane before the membrane ruptured. The results were interesting, but they were not such as to induce me to advocate, in the hope of saving the membrane intact, so early an intervention as a routine procedure. This immediate operation, however, has given us some valuable information regarding the condition of the antrum and the mastoid bone and cells before the membrane ruptures. Even in only moderately severe cases the bone of the mastoid process, particularly in the neighbourhood of the antrum, shares in the hyperæmia. And in several cases at this early stage the antrum was found to contain pus or semi-purulent liquid. But not invariably. I have repeatedly found, in operating before the membrane had ruptured, the antrum quite empty, although the osseous tissue around it was highly hyperæmic and bleeding very freely from its cut surfaces. In most cases the antrum contained a glairy, blood-stained mucoid material, and the same was also found at times in the mastoid cells when cells were present.

As to the effect upon the membrane of opening the antrum at this stage, in a few cases cure was obtained without the membrane rupturing, but in most the membrane did rupture shortly after the operation. As a matter of fact, it was evident that in most of the cases I operated on at this stage the rupture of the membrane was already imminent. In two cases, indeed, rupture took place while I was operating. So that it may be said that in this respect the mastoid operation did not receive a fair chance.

These findings dispose of the statement that has been made that the antrum is invariably the chief focus of infection in suppurative otitis media. My experience, even when allowance had been made for delay in operating, led me to think that if the antrum

(*Continued from previous page.*)

19. Report to appear later.
20. Valassopoulo, A.: Bull. et Mém. Soc. Méd. des Hôp. de Paris, 1917, 3rd ser., xli., 920.
21. Noc and Nogue: Bull. Soc. Path. Exot., 1921, xiv., 460.
22. Ryle, J. A.: Quart. Jour. Med., 1921, xiv., 139.
23. Dawson, Hume, and Bedson: Brit. Med. Jour., 1917, ii., 345.
24. Gwyn, N. B.: Contributions to Med. and Biol. Res., 1919, vol. i.
25. Valassopoulo, A.: Bull. et Mém. Soc. Méd. des Hôp. de Paris, 1920–21, 3rd ser., xliv., 942.
26. Elliott, C. A.: Arch. of Internal Med., 1920, xxv., 174.
27. The demonstration of *Leptospira icterohæmorrhagiæ* in human tissues is extremely difficult; the writer failed to find the organisms in specimens from five typical cases. They are probably not present in appreciable number after the sixth day of the disease.
28. It appears that in certain localities unusually susceptible breeds of dogs may exist, as may be deduced from the recent publication of Lebredo (Revista de Medicina y Cirugia de la Habana, Sept. 25th, 1921), who has infected adult Cuban dogs by means of intracutaneous injection or by feeding them with the visceral organs of guinea-pigs fatally infected with *Leptospira icteroides*. Notwithstanding persistent attempts to reproduce the infection in adult New York dogs according to the procedures indicated by Lebredo, we have not met with success.
29. Carter, H. R.: Nelson's Loose Leaf Medicine, vol. ii., 113.
30. Noguchi, H., and Pareja, W.: Jour. Amer. Med. Assn., 1921, lxxvi., 96.
31. Noguchi: Jour. Exper. Med., 1920, xxxi., 159.
32. Noguchi: Jour. Amer. Med. Assn., 1921, lxxvii., 181. See also reports of the International Health Board and the Rockefeller Foundation for the years 1920 and 1921.
33. Hanson, H.: Address before the Med. Assn. of the Canal Zone, August 19th, 1921.

is opened prior to the rupture of the membrane, then paracentesis should also be performed at the same time. To this statement there may be an exception to which I shall allude later on.

It may be held that these results show that opening the antrum does not drain the diseased area in the middle ear. With such an inference, however, I should not agree, since opening the antrum subsequent to rupture of the membrane undoubtedly does drain the middle ear as the results to be detailed in the following section clearly prove.

Posterior Drainage Subsequent to Meatal Drainage.

In cases which have not undergone cure shortly after the membrane has ruptured (or has been incised) I have over and over again been astonished on opening the mastoid to find pus, not only in the antrum, but also in the mastoid cells. In some cases, even granulations had had time to form. Moreover, those cases had given none of the classical signs of mastoid suppuration; there was no pyrexia, and no œdema over the mastoid process even after hard and prolonged pressure. Most of them, however, did complain of some tenderness on pressure. Hitherto, it may be remarked, the persistence for several days of this last feature has not been regarded as an indication for opening the mastoid. When the antrum and cells are opened during this period, pus may be absent from them, but the bone is always highly vascular, and in most cases the glairy mucoid material previously mentioned is present, often only in small quantity. But the appearances have certainly led to the belief that the infection from the middle ear generally involves the mastoid process.

As to the operation adopted, that has been simple. The usual post-aural incision is made. The mastoid process is opened with gouge and chisel, and its cells, if cells are present, are all exposed and cleared out. The operation is completed by the opening freely up of the mastoid antrum. In obviously a-cellular bones the antrum is directly attacked as in performing the first steps of the radical mastoid operation, care being taken to ensure the free opening up of all the small cells in its neighbourhood, a procedure which sometimes leads us to revise our first impressions as to the absence of mastoid cells. The bone cavity is then rubbed with bipp, a gauze drain is lightly inserted as far as the antrum, the tail of it being brought out at the lower end of the post-aural skin incision, the greater length of which is closed by sutures. A dry dressing may be applied for 24 hours, but thereafter fomentations are used. The gauze drain is removed at the first dressing and another may be inserted if desired. Gauze, however, is not a good drainage material, and it is better to employ a small drainage-tube for a few days. In most cases no drain at all after the first day is necessary. The post-aural wound may be allowed to close as soon as the discharge becomes serous.

In this operation the middle ear is not interfered with, except when, as often happens, paracentesis is performed. The membranous meatus is not opened. The bony meatus is left intact. It is, in short, what is generally known to otologists as the simple Schwartze operation.

The results of this early operation are gratifying. The discharge from the middle ear through the meatus usually stops immediately after the operation. In not a few cases the excellence of the posterior drainage is proved by the fact that *no discharge whatever appears in the meatus after the operation.* The consequence is that the membrane undergoes immediate and complete healing. No perforation is left and the hearing is restored. I should like to note, however, that the period of healing is shorter in adults and in children than it is in infants. In early life the infection seems to be more virulent, and a longer drainage is necessary.

It is interesting to be able to record another, and to me an unexpected, effect of the operation. If, as occasionally happens, some time after the disease has entirely subsided, a reinfection of the middle ear takes place, the tendency now may be for the pus to find its way out, not, as in the unoperated ear, through the membrane, but by way of the surgeon's opening in the mastoid process, to appear as a sub-cutaneous abscess under the post-aural scar. I have seen this happen as early as three months after the first operation, and as late as two years. In such cases I have succeeded in obtaining rapid cure by reopening the mastoid cavity as far as the antrum, but this time *without opening the tympanic membrane again.*

It is clear that the presence of such an easy exit to the pus must relieve the patient of much risk. Needless to say, reinfection of this nature can very frequently be avoided by the removal of tonsils and adenoids, if they are present, after the first operation. But cases exist, and the two I have just mentioned belong to this category, in which the ear becomes infected, although no indication of a predisposing factor can be found in the naso-pharynx or nose.

Conclusion.

Without considering myself unduly optimistic, then, I hold the opinion that by this simple procedure of early posterior drainage the surgeon obtains more control over the course of events than he ever can do if he is content to "wait and see." The operation is simple. In skilled hands the operation mortality is negligible. Its results are immediate and satisfactory, both as regards life and function. And in most cases—not in all—it eliminates the chance of chronic otorrhœa. Not in all, because cases occur in which the middle-ear disease at its very outset leads to serious damage to the bone of the tympanum; these cases will not be cured by anything short of a radical operation, and sometimes not even by that. But such cases are not common; when they do occur the patient's chances will certainly not be prejudiced by an early opening of the antrum, seeing that that operation constitutes the first steps of the radical operation.

DIATHERMY IN SURGICAL PRACTICE.*

BY W. H. CLAYTON-GREENE, F.R.C.S. ENG.,
SURGEON TO ST. MARY'S HOSPITAL.

THE subject that I have the privilege of discussing this afternoon (Diathermy) is a method of treatment which, we admit, is under trial. It was introduced into this country largely through the agency of Mr. Douglas Harmer and Dr. Elkin Cumberbatch, to both of whom I owe considerable gratitude for the help that they have given me in showing how the method is to be applied and in advice as to certain details of its application.

The principle of the method is, as you know, that of a cautery, but with this difference: that whereas with the cautery the destruction is limited to an area practically in contact with the cautery point, in diathermy, as used for surgical purposes, the area of destruction is enormously increased. There are two poles: the passive pole, which is connected to the patient's body by means of a pad impregnated with salt solution; and the active pole, or electrode, to which points of varying size and shape can be attached. And the chief advantage in applying this method, as opposed to the cautery, is the great ease with which the current from the active electrode can be directed to growths in relatively inaccessible positions.

I shall discuss, this afternoon, two regions of the body where the method has been applied fairly extensively: the oral and the vesical regions, and, after considering the various details in connexion with the application of the current, I shall give you a brief résumé of my experience as to its results.

* The opening paper to a discussion at the Section of Surgery of the Royal Society of Medicine on June 7th, 1922.

The Oral Region.

It was my great dissatisfaction with the results obtained by the ordinary operative methods in carcinoma of the tongue, tonsil, and floor of the mouth, that led me to adopt diathermy as an alternative. I admit that in an early case it is probable that the resection of the affected portion of the tongue is just as efficient as is the diathermic current; but in the more advanced cases I believe that diathermy has the following advantages:—

First, it does away with any question of cancer infection of the wound.

Secondly, it allows of the destruction of a much wider area of tissue than can be attained by the knife.

Thirdly, it is a method applicable to cases which are otherwise inoperable—i.e., inoperable unless one attempts a procedure of such magnitude as to be extremely hazardous.

It is particularly with regard to the inoperable cases that I have had the experience, because many of my colleagues have sent me cases which they declined to attack with the knife, asking me to do what I could to alleviate the sufferings of these patients, and my experience is, that first, there is the moral effect on the patient when he feels that something active is being done in the way of destroying a foul ulcer in his mouth; secondly, there is the undoubted physical benefit which accrues, because quite a number of cases of extensive epithelioma are retarded in their growth, and actually healed, after the application of this cautery. And finally, in the majority of cases, there is a suppression of the pain of which the patient so often complains.

Disadvantages of the Method.

The disadvantages of the method, apart from the fact that it requires a somewhat complicated apparatus, are these:—

First of all, it is advisable to ligate any of the main vessels, such as the lingual, that cross the route traversed by the cautery. Some surgeons assert that the mere prolonged contact of this escharotic current is sufficient to obliterate a vessel of the magnitude of the lingual, but, I have never relied upon that, as, I understand, a considerable number of cases of secondary hæmorrhage have occurred. So in all patients in whom it is necessary to remove a portion, or the whole, of the tongue, or the floor of the mouth, I invariably, as a preliminary, tie the lingual arteries. It has not been necessary, in any of my cases, to tie the carotid. In the application of the current to the tonsil I have generally been able to confine the activity of it to a safe area, except in one instance, where, later on, from recurrence of the growth, the carotid became invaded, and the common vessel was tied.

The second—and this is perhaps the most important—objection is that the wound is, of necessity, septic; we produce a foul slough in a foul cavity. And although, in cases submitted to operation in the ordinary way, a certain amount of sepsis is more or less inevitable, I admit that the amount of sloughing appears at first sight to be a detrimental factor in the application of the method. When we come to judge by results, however, it is interesting to note that in only one case—and that case will be referred to later—has any effect arisen from the presence of this large, extensive slough.

The third objection is the fact that bone touched by the point of the cautery will necrose, and the amount of time necessary for the separation of such necrosed bone usually amounts to several weeks, during which time the patient has to be scrupulously careful of the cleanliness of his mouth lest any septic complications should supervene. On the other hand, this necrosis may be regarded as an advantage, since it destroys that portion of the bone which is approximated to the cancerous area, without unnecessary mutilation; and therefore, at the same time kills any cancer cells which may have invaded that particular portion of the bone.

The last objection is a personal one; and that is that, in operating, a considerable amount of care has to be exercised, both by the operator and by the manipulator of the machine; otherwise the patient or the operator, or both, may be burned. So far, none of my patients have been burned, but on one occasion I burned myself very considerably, and the burn took some time to heal.

Method of Attack.

The next question in the discussion is, How should these cases be approached? That is to say, should they be done in one, or in two, stages? Assuming that an extensive dissection of the neck is necessary for the removal of glands, it obviously seems unwise, on first consideration, to produce at the same time an admittedly septic condition of the mouth with a foul slough. On the other hand, it is impossible to deal with the case by local treatment in the oral region first, with subsequent dissection of the glands, owing to the risk of secondary hæmorrhage, and because of the inflammatory infiltration which occurs. I am becoming more and more convinced that the big gland dissections practised in cases of carcinoma of the tongue are futile. If the glands are not involved, the operation is unnecessary; and if they are, it does not seem to prevent recurrence, and I believe that is the experience of many of my colleagues. If a moderate dissection is done in which obviously enlarged glands, such as the carotid group and the submaxillary triangle group, are cleared, and the lingual and the facial arteries are tied, I do not find that there is very great disadvantage in completing the operation by destroying the cancer in the mouth. But if the dissection is of wider range, then I should hesitate to do it.

In contrasting cases where there has been an interval between the removal of the glands and the ligature of the vessels and the subsequent destruction of the carcinomatous area, I have been impressed by the fact that the recurrence seems to take place more certainly in those in which the operation is done in two stages. I am inclined to think that an actively inflamed area draining into glands infected with cancer cells is of some benefit.

There has been some discussion lately upon the effect of radium locally in cases of glandular infection secondary to epithelioma of the tongue, and Quick, of New York, is emphatic in giving his experience that the glands are protective and can be dealt with *in situ* by the embedding of radium tubes. Judging from the very unsatisfactory results obtained by the ordinary methods of surgery, I am becoming more conservative towards the glandular areas, and I think it possible that the active suppuration associated with the separation of the slough and with the subsequent hyperæmia and irritation of the glands, may possibly be beneficial.

Results in a Series of Cases.

With regard to the results, 31 have been submitted to operation. There was one death from bronchopneumonia, and this, in itself, is curious when one considers how much sloughing there is in the mouth in these cases; and I attribute the immunity which undoubtedly exists after this method of treatment to the fact that no blood whatever trickles down the trachea into the lung. The cases were all operated upon with intra-tracheal anæsthesia, and, of course, it is very necessary to stop the administration of any ether before the local attack on the growth is made. But I have been struck by the absence of this pulmonary trouble, and with the complete absence of pain subsequent to the most extensive destruction of what would appear to be a very sensitive region.

It is, perhaps, too ambitious to expect many cures. Most of the cases submitted to this treatment have been too advanced to allow of any of the ordinary operative methods being practised; but of the 31 cases, there are six in which there has been no recurrence, either local or in the glands. In a certain number there has been a local cure, so far as the primary focus is concerned, but the glandular enlarge-

ment has continued, and has subsequently led to the death of the patient. But with few exceptions there has been alleviation; and I would lay stress on this side of the question in diathermy. As I said before, the moral and physical value is very great.

In one case only was there failure to alleviate the distressing pain and discomfort which the patient suffered from, and that was in a case of my colleague Mr. V. Warren Low, where there was a very extensive growth, involving the floor of the mouth. It was in a woman, and, as you will agree, inexplicable though it is, cases of epithelioma of the tongue seem more malignant in this sex than in men. In that instance I did no good at all. She got little benefit, and there was a rapid return of the growth locally. But, with that exception, I feel satisfied that I have given comfort to many sufferers by this method when no other active treatment was available.

The Vesical Region.

The second region where I have used it has been the bladder. In this region the method has been more popular and more widely applied than in the mouth. The number of these cases in which I have used it is comparatively small, and many others here present are more competent to deal with this part of the discussion than I am. But, as far as my experience goes, the small localised growths seen early are efficiently treated and well controlled by intravesical cystoscopic methods.

When the growth is very extensive, the alternative will lie between resection of the bladder wall and destruction of the papillomata through a suprapubic opening, and this is the method that I have practised in some six cases. In all of them the growth was advanced, and an extensive area of the bladder was involved, which would have necessitated a wide resection, and in some of them the technical difficulties in the operation would have been considerable. It is admitted that one of the unsatisfactory features of operations upon papillomata of the bladder is their tendency to recur, not only at their original site of growth, but also from implantation infection in the edges of the wound. By widely opening the bladder, and passing down a non-conducting speculum, the growth is adequately exposed, and it can be destroyed then and there with considerably less risk of cell infection of the wound than if it is to be excised with subsequent suture of the rent in the mucous membrane. Of the six cases which I have done by this suprapubic method, one died as a result of a too-prolonged operation in a very unsuitable case; all the others have done singularly well. The scarring of the bladder does not appear to interfere with the function of the ureters, even when the cauterised area passes over the ureteric opening and the *restitutio ad integrum* has been surprising.

Conclusion.

In conclusion, I am not urging that this method is one which should be adopted in preference to any other; I am simply giving you a frank expression of my experience in connexion with the method over some three years. Personally, I think it has a great deal to commend it. It is not going to cure impossible cases; it very likely is of no more value in early cases than local excision; but in the large group of inoperable cases, where the surgeon has to turn away reluctantly admitting his inability to operate with any chance of success, then the method of diathermy supplies a want in the most admirable manner, and gives relief where no other relief but morphia can be found.

THE BOROUGH OF DEPTFORD AND BIRTH CONTROL.—A conference will be held at the Town Hall, New Cross-road, S.E. 14, on July 10th, at 8.30 P.M., on the subject of Birth Control, convened by the Mayor of Deptford, Alderman W. H. Green. Dr. C. S. Thomson, the M.O.H. for Deptford, will open with a short paper. All the clergy and medical men of the borough will be invited in addition to members of the borough council and representatives of various public bodies.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CASE OF FOREIGN BODY IMPACTED IN THE RIGHT SECONDARY BRONCHI.

BY GEORGE NIXON BIGGS, M.B., B.S. DURH.,
SURGEON IN CHARGE OF EAR AND THROAT DEPTS., SEAMEN'S HOSPITAL, GREENWICH, ROYAL WATERLOO HOSPITAL, ETC.

THE interest in this case lies in the fact that although the foreign body, a screw, had been present for over six weeks the patient had carried on his ordinary life without suffering any inconvenience whatever.

On June 18th, 1921, A. B., aged 16 years, presented himself at the out-patient department of the Royal Waterloo Hospital, giving the following history. Six weeks previously he was crossing the road with a screw in his mouth when he was nearly run down by a motor-bus. In his endeavour to avoid being run over the screw disappeared, and he was not sure whether it had fallen out of his mouth, or whether he had swallowed it. The patient presented himself at the hospital on account of the fact that he was worried as to what would happen to him in the event of his having swallowed the screw, and *not* because any symptoms of a foreign body were present. An examination of the chest revealed a small patch of dullness in the right lung. No other physical signs were present, but the dullness and absence of breath sounds under the circumstances gave rise to the suspicion that the foreign body might be impacted in one of the bronchi. The boy was X rayed, and as a result of this the presence of a screw in one of the right secondary bronchi was demonstrated. The screw was lying head upwards, and had been sucked so firmly down into the bronchus that it was very difficult indeed to remove—in fact, at the first attempt it was impossible to do this owing to the amount of bleeding which took place. On the following day it was possible to get hold of the head of the screw, and it was removed quite easily through a bronchoscopic tube.

GANGRENE OF THE SMALL INTESTINE DUE TO THROMBOSIS OF BRANCH OF SUPERIOR MESENTERIC ARTERY.

BY JAMES NOEL GREENE NOLAN, M.D. DUB.,
DEPUTY MED. SUPT., HELLINGLY MENTAL HOSPITAL, SUSSEX.

THE rarity of the causation of the terminal condition of the following case makes it of interest.

On March 21st, 1922, Mrs. E. L. G. was admitted to the Reception Hospital suffering from mania. She was very excited, confused, and incoherent, and could give little account of herself. The only available information was to the effect that she had recently left Barming Heath Mental Hospital and was thought to be suffering from phlebitis.

Condition on Admission.—Patient was a well-nourished woman, aged 46. Left leg swollen, particularly about joints of knee and hip; exquisite tenderness to the slightest touch and attempts at active or passive movement caused intense pain. Respiratory system: nil. Circulatory system: heart not enlarged; soft mitral systolic murmur; pulse 80, regular, fair tension. Genito-urinary system: ventral scar of hysterectomy. Alimentary tract: tongue coated; breath offensive. No abdominal pain or tenderness, some sense of resistance in pelvic area. Fæces palpable in pelvic colon. Urine: specific gravity 1022, albumin positive, sugar negative. Temp. 98·2° F. Respirations 22.

On the 22nd her condition remained the same, but she refused food. Bowels open naturally. Slept three hours. On the 23rd she became acutely ill. P. 140, T. 99·8°. General abdominal tenderness and persistent vomiting of brown fluid, non-fæcal smelling. Bowels open twice naturally. Heart action irregular, increased murmur. Pulse soft and thready. Her mental state cleared and her conduct and conversation were rational. She complained of intense thirst and pain in abdomen, and looked acutely ill. Operative interference was delayed in the hope of the patient rallying and the absence of any localising symptoms. On the 24th she rapidly grew worse, pulse-rate and temperature increasing, the latter for the first time reaching 100°; the vomiting became more continuous but unchanged in character. Bowels open once. She died the same evening. Only a limited examination was permitted.

Post-mortem.—On the abdomen being opened nothing abnormal could be seen save dense adhesions between omentum and scar tissue of anterior abdominal wall, but no constriction of the bowel. There was no free fluid, nor was the gut distended. Appendix normal. On examination the duodenum and jejunum for the first 8 ft. were in a gangrenous condition. The stomach, the remainder of the jejunum, ileum, and large bowel were empty, and apparently healthy. No gross changes were noted in the other abdominal organs. The heart was examined and showed fairly recent inflammatory changes but no unorganised vegetations.

Dr. H. Wolseley-Lewis, medical superintendent of Barming Heath Mental Hospital, kindly sent me notes relating to the onset of her attack while under his care, from which it appeared that after being under care for a year she fell ill in November with abdominal symptoms and was found to have bacilluria. In December the condition became generalised, with acute endocarditis, followed by polyarthritis. An autogenous vaccine of *B. coli* was prepared and seven doses given. She was removed by her husband during the course of this treatment.

I am indebted to Dr. F. R. P. Taylor, resident physician and medical superintendent, for permission to publish these notes.

A CASE OF ACUTE MANIA

FOLLOWING UPON OPERATION FOR THE EXTRACTION OF SENILE CATARACT.

By GEOFFREY B. LOWE, M.A. CAMB., M.R.C.S.,

LATE RESIDENT SURGICAL OFFICER, BIRMINGHAM AND MIDLAND EYE HOSPITAL.

THIS case is recorded as an interesting example of one of the more rarely seen sequelæ to cataract extraction in the aged.

Mrs. E. C., aged 82, was admitted to the Birmingham and Midland Eye Hospital on March 15th, 1922, for cataract extraction. She underwent routine preparation; the urine was normal and the bowels were well opened the day before operation. On March 21st I removed the cataract by the simple operation under local anaæsthesia of four instillations of cocaine hydrochloride 4 per cent. On the evening of the same day she was rather restless and spent a disturbed night without sleeping. The next morning the pad over the unoperated eye was removed.

About midnight of the 22nd-23rd she developed an attack of acute mania, was very violent and noisy, and could not be got back to bed until after an injection of hyoscin. hydrobrom., gr. 1/100; morphin. sulph., gr. 1/6; atropin. sulph., gr. 1/180. She had a good though somewhat hard pulse, and slept quietly until about 7 A.M., when she awoke mentally clear. A mixture of ammon. bromide with chloral was refused after one dose, and at 2 P.M. another attack of acute maniacal excitement commenced. She was given another injection of the same preparation of hyoscine, morphine, and atropine.

She slept again until 11.30 P.M., when she awoke quite rational. During the 24th she took her medicine and food normally. An examination of the urine on this day showed the presence of a minute trace of sugar. The pad upon the operated eye was removed as an additional precaution against further mental trouble, though she had made no attempt to touch her eye herself during the period since operation. On the next day, the 25th, the mixture was given once only as a sleeping draught at night, when the patient had some slight delusion as to her whereabouts, thinking she had been moved out of the hospital. There was no excitement, and she spent a satisfactory night.

From that date recovery was uninterrupted. There was no sugar in the urine on the 27th, and on the 29th she was strong enough to be discharged. The operated eye showed no sign of the very disturbed course during its healing, the wound being firmly closed.

Mr. T. Harrison Butler[1] in 1920 drew attention to these cases, pointing out that they are limited neither entirely to the aged nor to the one type of operation. He does not consider the fact of binocular occlusion a sufficient cause to account for the initiation of the attack, or that atropine instillations would be contributory, and in this case no atropine had been given before the mania showed itself.

I am indebted to Mr. J. Jameson Evans, hon. surgeon to the hospital, for permission to record this case.

[1] Transactions of the Ophthalmological Society of the United Kingdom, vol. xl., 1920.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF SURGERY.

DIATHERMY IN SURGICAL PRACTICE.

A MEETING of this section of the Royal Society of Medicine was held on June 7th, with MR. RAYMOND JOHNSON, the President, in the chair.

MR. W. H. CLAYTON-GREENE read a paper on Diathermy in Surgical Practice, which we publish in full in this isue of the THE LANCET.

Discussion.

MR. DOUGLAS HARMER said that to the late Dr. Lewis Jones, for inducing Prof. Nagelschmidt to give a demonstration with his own apparatus at St. Bartholomew's Hospital, should be awarded the credit for having introduced diathermy into this country. Prof. Nagelschmidt demonstrated on three cases; (1) a nævus of the tongue; (2) a post-nasal tumour; and (3) a case of ordinary enlarged tonsils, all of which proved successful cases; the patient suffering from post-nasal tumour lived for two years. In Mr. Harmer's own experience, diathermy was the best treatment for growths of the upper air passages; excision by the knife in these cases yielded only 33 per cent. of cures, and recurrences were almost invariably in the scar, showing that dissemination had taken place at the time of operation. He then described a number of cases in which he had successfully employed diathermy, notably an endothelioma at the root of the nose, and a large rodent ulcer involving the whole orbit. For carcinoma of the floor of the mouth he practised excision, followed by diathermy applied to the wound by the plate or button. If the glands were not involved he did not perform any operation in the neck, and he had found the prognosis very good. He had one case still living eight years after this operation, who presented no signs of secondary glandular involvement. For carcinoma of the tongue he practised excision with the diathermy knife. Ligature of vessels was unnecessary in this operation. For carcinoma of the tonsil, in which surgery admittedly failed, diathermy gave relief from pain, increased mobility of the mandible, and prolonged life sometimes for three or four years. For growths of the upper jaw he performed Moure's operation, followed by diathermy to the wound. In the case of the cheek the use of diathermy was limited by the proximity and consequent risk of sloughing of the skin. From over a hundred cases he considered that the results were excellent. There had been two deaths from secondary hæmorrhage, not more, he thought, than would have occurred after ordinary surgical operations upon similar cases. There was a striking absence of fever or toxæmia after diathermy, and most of his cases were able to get up after 48 hours. The relief from pain and the smooth and pliable scars which resulted were remarkable. His conclusion was that diathermy should be employed in all cases of malignant disease of mucous membranes, and that it might usefully be employed also for lupus, extensive nævi, and warts.

DR. E. P. CUMBERBATCH showed two cases treated by diathermy. The first showed the scar of a rodent ulcer treated seven years ago by diathermy. The ulcer had healed in the first instance after ionisation by the late Dr. Lewis Jones, but broke again down and proved refractory to ionisation on this occasion. The second case was that of a boy who had had a large pigmented mole in the submental region. Diathermy had destroyed the mole, leaving a scar which was in no way disfiguring. Dr. Cumberbatch said that diathermy was most useful for nævi of the tongue, leaving scars that were almost invisible. In lupus it gave rapid and good results. The uses of diathermy in malignant

disease had already been discussed, but he emphasised the fact that diathermy was not advisable for advanced cases exhibiting cachexia, in which there was a considerable danger of secondary hæmorrhage.

Mr. CECIL ROWNTREE had employed diathermy in a number of cases at the Cancer Hospital, but had encountered a number of technical difficulties and had the misfortune to burn himself. He agreed with Mr. Clayton-Greene that such burns were slow in healing. The anæsthetic presented considerable difficulties. Intratracheal ether had been employed in some cases, but he was obsessed by the danger of an explosion, and now his anæsthetist was giving intra-tracheal chloroform. The china gag described by Mr. Clayton-Greene overcame the difficulty he had experienced with the ordinary metal instrument. A further technical difficulty was that the vapour produced in the mouth obscured the operator's view. In his experience secondary glandular infection and secondary hæmorrhage not infrequently occurred; sometimes he had thought it advisable to ligature a vessel before applying diathermy. Sometimes the glands in the neck enlarged rapidly after diathermy applied to a primary growth in the mouth, and were found on operation to be mere sacs of pus enclosed in a lining of cancer cells. He was therefore still undecided as to whether the glands should be removed first. He agreed with the previous speaker as to the relief of pain and the prolongation of life. The cases upon which diathermy had been practised at the Cancer Hospital were all advanced ones; in these cases he thought something should be done for the glandular infection if permanent cure were aimed at.

Mr. W. G. SPENCER could not subscribe to the extreme views expressed by one of the speakers. He pointed out that the scar left after diathermy was virtually a burn scar and therefore liable to become epitheliomatous. As regards the boy shown by Dr. Cumberbatch (the pigmented nævus case), he thought still further improvement would result from excision of the scar. He pointed out that as regards rodent ulcer, even when fairly extensive, excision with the knife proved very satisfactory, and in practised hands left scars that were almost invisible. He congratulated Mr. Harmer on some of his results, but inquired whether in the cases of ulcers of the floor of the mouth the diagnosis of malignant disease had been confirmed by microscopic examination in all cases before diathermy was applied. Hitherto Butlin's 30 per cent. of cures represented the high-water mark of success in these cases. Mr. Spencer himself disliked the idea of cauterising large areas in the mouth; he much preferred to make a wound which he could suture entirely, and thus obtain healing by first intention.

Mr. R. DAVIES-COLLEY said that his experience of diathermy dated from 1910, when he had seen it used for two cases. In one case its employment for a growth resulted in the separation of a sequestrum from the maxilla. The antrum healed up and a very supple scar resulted, so that the patient was able to open the mouth well. For advanced rodent ulcer he was convinced that diathermy was the best treatment. As regards the tongue, excision followed by diathermy was sound treatment for carcinoma, but recurrences took place in the neck unless this also was treated surgically. His view of diathermy was that it constituted the best accessory to surgical treatment of malignant disease, but that it should only be used as an accessory. He had also found it useful for the treatment of suppurating tuberculous glands of the neck with sinuses. He had seen one case of secondary hæmorrhage and one bad burn necessitating a skin graft. The absence of pain and the suppleness of the resulting scar were especially noticeable.

The PRESIDENT said that his experience of this form of treatment was very limited, but inquired of the opener whether he considered diathermy to be an accessory to ordinary surgery or thought it should replace surgery for such a case as an early carcinoma of the tongue. He also inquired to what depth the cautery effect of diathermy spread.

Reply.

Mr. CLAYTON-GREENE said that if he should be so unfortunate as to develop an early carcinoma of the tongue he would prefer the excision of one-half of his tongue by the diathermy knife, followed by the dissection of his submaxillary region—all to be performed at one sitting. The depth to which cancer cells were destroyed by diathermy was about half an inch; this was greater than could be obtained by Paquelin cautery.

Mr. HARMER stated that the diagnosis of malignant disease had been confirmed by microscopy in all the cases which he described.

MEDICO-PSYCHOLOGICAL ASSOCIATION OF GREAT BRITAIN AND IRELAND.

A MEETING of this Association was held in the rooms of the Medical Society of London on May 25th under the presidency of Dr. C. HUBERT BOND, who referred to the loss by death of Dr. F. C. Blakiston (Isle of Man Mental Hospital), Dr. H. K. Abbott (Fareham Mental Hospital), and Dr. James Middlemass (Sunderland Borough Mental Hospital).

Sir FREDERICK MOTT read a paper on the

Genetic Origin of Dementia Præcox,

in which he began by referring to previous publications he had made concerning the changes found in the cells of the central nervous system, especially the cortex, which would account for suspension or suppression of function, and consequently disintegration of the psychic unity. He assumed that the less severe changes denoting hypofunction would account for cases in which recovery or partial recovery occurred. Some cases began with what was diagnosed as confusional insanity and manic depressive insanity, which had terminated in post-adolescence in dementia, and he had found in these cases a regressive atrophy of the reproductive organs similar to that found in 27 male cases of dementia præcox. He regarded all these types of psychoses as genetic in origin, and he referred to the two schools of thought in relation to dementia præcox—the psychogenic and physiogenic; according to Jung, the primary cause is a psychological fault in function whose history can be traced back to childhood. The physiogenic theory which Sir Frederick Mott (based upon his researches) advocates presupposes an inherent germinal narrow physiological margin of normal functional capacity of the brain, and stresses, whether physiological, psychological, or pathological, may be sufficient to excite, reveal, or accelerate the disintegration of the psychic unity owing to the genetic inadequacy. He referred especially to the effect of emotional stress and mental conflict with repression of visible manifestations upon the endocrine glands, and the inter-relation of the suprarenal, thyroid, reproductive organs, and brain. He considered that the influence of toxic agents per se in the product of the true psychoses is exaggerated.

Sir Frederick Mott next described the microscopic examination of the brain and reproductive organs of two interesting cases of dementia præcox; one a congenital imbecile with infantile uterus and ovaries, who developed symptoms of dementia at puberty. Here there was arrest of development of the supra-granular layer of pyramids of the neo-cortex, with glia proliferation. This may be correlated with the ineducability of the girl. At puberty symptoms of dementia came on, and this may be correlated with a widespread degeneration of the cells of the cortex, especially of the deeper layers of pyramids and the polymorph and infragranular layer, which Shaw Bolton conceives is connected with the vegetative and reproductive functions. The other was a case of acute dementia præcox occurring in a highly intellectual youth in which there was insanity on both the maternal and paternal side. There was a marked regressive atrophy of the testes together with the characteristic changes in the cells of the cortex. A brother who died

from bullet wound of brain also had a similar regressive atrophy of testes. A sister suffered with manic depressive insanity. "The last to come ontogenetically the first to go," a dictum of Hughlings Jackson, Sir Frederick Mott thought may possibly be explained by the fact that the countless millions of cells of the cortex cerebri are developed from relatively few of the protomeric cells constituting the neural tube and primary cerebral vesicles. Therefore, if there is a germinal defective formative energy it is this part of the nervous system which is latest developed ontogenetically and phylogenetically that will be affected either by arrest of development or by an innate lack of durability. The supragranular layer of pyramids of the neo-cortex is the latest developed, and may therefore, as in the imbecile, undergo arrest of development. As the sex instinct in adolescence matures it stimulates and energises all the cells of the body, including those of the brain, but if there is a genetic inadequacy with a narrow physiological margin of the highest level of neurones upon which to function and maintain metabolic equilibrium, then any one of the stresses mentioned may be sufficient to cause hypofunction with suspension or suppression of the normal activities of the highest and latest developed level, and disintegration of the psychic unity.

Discussion.

The PRESIDENT asked whether the dictum of Hughlings Jackson, which had been amply confirmed, that the faculties or functions which came last were the first to go, could be regarded as a progressive fact—in other words, as era succeeded era, would the more recently developed structures assume a condition of greater stability than at present?

Dr. W. F. MENZIES pointed out what seemed to him an objection to Sir Frederick Mott's theory—namely, that the Betz cells were analogous to neo-cortex and were of late development, philogenetically and ontogenetically, and therefore, on this reasoning, ought to be affected, but were not in primary dements. Moreover, the Betz axons were not myelinated.

Dr. J. CARSWELL spoke of the far-reaching importance of this communication in giving a true insight into the pathology of mental disease. With regard to the remarkable fact mentioned by Sir Frederick Mott that of 10,000 Serbians in the war who had had great stress and every variety of privation, only five became insane as a sequel, in the speaker's large experience among the mentally afflicted in Glasgow, the incidence of insanity per annum among the industrial population in a large engineering locality was the same—namely, 5 per 10,000, even though stress and strain and indulgence in alcohol were operative there too. In districts where dwelt what might be termed the sediment of the population, the incidence of certifiable cases rose to 10 or 12 per 10,000. Figures such as these supported the view of those who said that for stress and strain to result in insanity there must be organic genetic defect also.

Dr. HARVEY BAIRD asked whether spermatic or ovarian extract was likely to do good in the cases Sir Frederick Mott referred to. In a few cases of dementia præcox he, the speaker, had tried it, but he could not say it was successful.

Dr. J. A. MILLS asked whether the failure of the endocrine glands or the defect in the supra-marginal layers of the cortex was the greater factor in cases of dementia præcox, or were both defects correlated in the production of the condition?

Prof. GEORGE ROBERTSON (Edinburgh) agreed that all forms of insanity appeared, at their margins, to run into one another, like the colours in the rainbow, which were not sharply demarcated but merged into the next. He was much struck by Sir Frederick Mott declaring that it was not necessarily the brain which must be investigated in these cases, reminding him of the view that the intestinal tract was largely responsible. A number of post-mortem examinations on cases dying of mental disease revealed changes in the central nervous system which he regarded as the cause of the mental condition.

Reply.

Sir FREDERICK MOTT, in reply, said the Betz cells, as shown by their myelination, were ontogenetically of earlier development than was the rest of the cortex. There was myelination in all the projection centres, and the sensory motor cells must be myelinated before the association cells, as it was only at birth that an individual could have a simple sensation; later these were linked up with perceptions. In the dog's brain myelination was more developed in ten days than in the human brain in three months. It must be remembered that a cell nourished itself, it was not nourished; therefore he did not expect improvement in dementia præcox from the giving of extracts. If any were at all hopeful it would be thyroid, because the thyroid secretion originally went into the alimentary canal, and therefore it could be absorbed. Moreover, when extracts were given by the mouth, it was not definitely known what happened to them; therefore it would seem to be wiser to give them by the rectum or the vagina. The typical form of the disease under discussion was dementia simplex—loss of mind—and that he associated with degeneration of the nerve cell which was beyond repair, though many symptoms depending on hypo-function might get better.

The Maudsley Lecture: Education in Relation to Mental Disorder.

On the same day members attended at the County Hall, Spring Gardens, to hear Sir MAURICE CRAIG deliver the Third Maudsley Lecture, the subject being Some Aspects of Education in Relation to Mental Disorder.

Sir Maurice Craig said that Maudsley, perceiving that mental disorder was not purely a medical problem but had a lay aspect, had directed that in alternate years a scientific and a popular lecture should be given under his benefaction. A key to his attitude was provided by his remark, "There are not many natures predisposed to insanity but might be saved from it were they placed in their earliest days in exactly those circumstances and subject to exactly that training most fitted to counteract that innate infirmity." The problem of how insanity was brought about could be best solved by the close collaboration of physician, psychologist, and educationalist. Physicians must seek to control its beginnings. Investigation was continually strengthening the view that many disorders originate in childhood, and this was true of the more common types of mental disturbance. A child had the tendency to inherit the attributes of its parents, but this could be largely counteracted by suitable methods. The types of insanity which were intrinsically part of the organism, and for which little could at present be done, formed the smaller group; most cases of insanity resulted from exhaustion and emotional states. In the child special watch should be kept for any regressive symptoms, indicating a dropping back to an earlier child phase. In subjects of nerve exhaustion an outstanding symptom was hypersensitivity, and this affected also the mental processes; it might slowly, but surely, undermine the whole mental fabric, for it heightened introspection and aggravated all the normal characteristics of the individual. This hypersensitivity might give place to a psychical anæsthesia, in which the mind might become a blank, or be in some other way disordered. Hence it was important to defeat the progress of this symptom. In childhood its most prolific cause was over-stimulation, it might be by parties or by unsuitable surroundings, and it showed itself by gastric disturbance, irritability, and unsatisfactory sleep. The naturally quick child was more prone to this than the dullard, and it was increased by early ability to read. The danger of this over-stimulation was increased by the brilliant boy's ambition to outstrip his associates at school. If this resulted in a

scholarship, he was expected to live up to his acquired standard. Brain exhaustion was a slow process, and it might not declare itself until after school days had ended. Only a small proportion of brilliant boys fulfilled the promise of their earlier years. The brilliant child's success in games further increased the risk of a breakdown—the same nervous system served both body and mind—and Sir Maurice Craig had seen excellence in games cause mental deterioration before the age of 20. The causes of hypersensitivity included physical diseases and disorders, defective sleep, and over-action of various mind processes. Rural life had its own peculiar influences different from those in the town, for instance, intermarriage and the narrowed life of villages. One of the earliest symptoms of over-stimulation and exhaustion was inability to concentrate the attention. If the power of attention had been once acquired by the child, losing it should be looked upon as evidence of regression and regarded as important. Laziness, however, was a natural mental reaction to a debilitated state of mind; and to ignore it or to punish for it would be cruel if the real circumstances were known. Dr. Herbert Gray, late headmaster of Bradfield College, wrote that the most productive work of the term was done during the first half of it, and both masters and industrious boys tailed off at about the ninth week.

Sir Maurice Craig laid stress on the dangers of defective sleep. Until its fifth year a child should be trained to sleep in the daytime. Up till 16 years of age there should be at least ten hours of sleep, and from 16 to 20 nine hours, unbroken by dreams and nightmares; if these occur, the child should be regarded as unfit for school. Sleep was rhythmic, and harm was done if this rhythm was broken by evening dances and theatres. Evening school preparation was definitely harmful to some children. With regard to emotion, Dejerine had shown how this might affect the mental health; the exhausting effect of passion was well recognised. Some of the slighter types were less easy to discern, but they might work serious havoc. If the emotion were an unhappy one, it might lead first to preoccupation, then apparently fill the whole world of thought. The child who had fears must be helped by a sympathetic and philosophical understanding; otherwise there might be loss of sleep and a lessening of mental activity by setting up a hyper-attention on one subject, and a sense of inferiority, a feeling of being unlike others. Introspection and unhealthy reasoning followed, and might result in the subject leading a solitary existence. Repression had attracted increased attention with the advent of the "New Psychology." Freud declared that forgetting unpleasant events was a positive process, a repression out of consciousness; but this was only partially true. There was, as Freud said, a danger of a conflict taking place between the primitive instincts and the demands of the community, and the termination of such a conflict might only be possible by active repression of the primitive instincts, which usually entailed emotion, and was therefore fraught with danger. The repressed unpleasant experience could remain a dissociated portion of the mind, and become active again in virtue of its originating emotion. Many so-called repressions were not completely subdued, and their continuance had a very wearying effect on the nervous system. The damaging effect of a conflict was most serious on the plastic brain of the young. He did not agree that most of these complexes were sexual in character, and thought that if this were less insisted on by Freud, his theory would greatly benefit. That great authority had done valuable service in drawing attention to the damage wrought to the mind by mental conflicts and their subsequent repression: and this should cause educationalists to inquire whether their attitude towards the child was the correct one. The influence on the child of an unrestful house must be great. When, and in what way, to punish the child became problems of increasing perplexity as more became known of the working of the mind. Corporal punishment was often administered according to tradition and custom rather than according to the exercise of a wise judgment.

On the subject of phantasy, Sir Maurice Craig said that make-believe was a normal characteristic in all young children. The teacher should help prepare the transition from phantasy to reality. If the latter were too hard, the haven of phantasy would be sought too often, or fretful disappointment might result in nervous disturbance. A sympathetic discernment was called for, instead of the too frequent alternation of "sloppy" sympathy with undisciplined irritability. A phantasy in older life having no normal relationship to actuality indicated regression. Self-expression had been sadly neglected in the past; schools had been conducted to meet the requirements of a standardised child, those whose mentality did not fit into this being regarded as chronic failures. It was tragic to see the introverted child suffering acute mental anguish in consequence of a closing of the way to mental development, all because such a child was not understood. If too retroverted, on the other hand, its mental future was in jeopardy through an unduly high appraisement of its own ability. But such a child, properly led, was an easier case to deal with than an introvert. Self-discipline must be the goal of all mind-training. Undisciplined, querulous persons often vented their displeasure in spiteful acts, and the end of a long course of contending with men and things was, frequently, the mental hospital. Yet this could have been avoided by reasonable care in earlier life. In testing what a man had made of his life it was rarely a question of pure learning; it was knowledge added to something else which gave it value. It was this "something else" which made or marred the history of that life. Some men "risen from the ranks" had, by hard work and study, acquired a good position only to find that their personality was unsuited to the post. In conclusion, Sir Maurice Craig said the time was now awaited when the legislature would show its appreciation of the advances made in knowledge by relaxing the law. Meantime the lay public should be made to understand that mental disorder was rarely of sudden development, and that much could be done to prevent it.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—The annual dinner of this society was held at Princes Restaurant on June 7th, the President, Sir George Lenthal Cheatle, in the chair, and was a most successful function. After the loyal toasts had been honoured the toast of the Imperial Forces was proposed by Mr. McAdam Eccles. In the absence of Surgeon Vice-Admiral Sir Robert Hill, Lieut.-General Sir Arthur Sloggett replied for the Senior as well as the Junior Service. Sir Anthony Bowlby then proposed the health of the Society, which he described as a society where the consultant and general practitioner met and exchanged ideas under the happiest auspices. Sir George Lenthal Cheatle replied. The health of the Cavendish lecturer, Prof. Harvey Cushing, was proposed by Sir Arthur Keith in a brilliant dinner speech. No man, he said, was better fitted to cement the brotherhood of the medical professions in the two great English-speaking countries than Prof. Cushing. After Prof. Cushing had replied, the toast of kindred societies and guests was proposed by Sir Alfred Rice-Oxley and replied to by Mr. James Berry, President of the Medical Society of London, and Sir William Willcox, President of the Harveian Society. The health of the President was proposed by Dr. Rickard Lloyd, and Sir George Lenthal Cheatle replied.

INTERNATIONAL CONGRESS OF OTOLOGY.—As already announced, this congress will be held in Paris from July 19th to 22nd next. There will be an exhibition of instruments, ancient and modern, associated with otology and rhinolaryngology, and one of anatomical and pathological preparations. The exhibits will have a good *mise-en-scène*, as large rooms are available in the Faculté de Médecine; they should be sent by June 20th at latest, addressed: Drs. Mahu et Truffert, Faculté de Médecine, Rue de l'École de Médecine, Paris, France.

Reviews and Notices of Books.

PRACTICE OF MEDICINE IN THE TROPICS.

Vol. II. Edited by W. BYAM and R. G. ARCHIBALD. Oxford Medical Publications. London: Henry Frowde and Hodder and Stoughton. 1922. Pp. 1682 and Index. £4 4s.

THE second volume of a treatise on the practice of medicine in the tropics will make a wide appeal to the practitioner, for here are collected those essential facts upon which the science of tropical medicine rests.

The volume opens with two chapters on the differential diagnosis of acute and chronic disease by the senior editor. The task which Lieut.-Colonel Byam had before him is none other than an epitome of the main diseases known to science, and he has performed it well. The next section treats of bacterial diseases, and begins with a lucid introductory paragraph by Carl Browning. D. Harvey and J. H. Tull Walsh give a well-considered and up-to-date account of the enteric fevers, while the subject of undulant fever is naturally entrusted to Sir P. W. Bassett-Smith; this section supplies a real want, as does also the account of bubonic plague by Victor Heiser and of the pneumonic variety by G. L. Tuck. Cerebro-spinal fever seems somewhat out of place in a reference book on tropical diseases, mainly because the account by J. A. Glover and E. G. D. Murray is based upon researches carried out in England, supplemented in a chapter by Sir Walter Buchanan on the disease as it occurs in India; the latter account, though excellent in its way, barely conveys to the student a true picture of cerebro-spinal meningitis as met with in other parts of the tropics. Cholera is discussed by Sir Leonard Rogers, and is based upon his well-known views, with especial emphasis on treatment. Bacillary dysentery is described adequately from every point of view by Philip Manson-Bahr and H. Marrian Perry; the authors had the advantage of the collaboration of the late Sir Patrick Manson, and the chapter is one of the most complete and satisfactory in the whole book. The subject of leprosy is most ably handled by George McCoy, of the U.S. Public Health Service, and is illustrated by some admirable photographs. A chapter on tuberculosis in the tropics, by G. E. Bushnell, late Colonel in the U.S. Army Medical Corps, is a new departure, and well illustrates the disease as it occurs in the negro.

The third section in this volume (Section IX.) is devoted to spirochætal diseases; Noguchi handles the subject of infectious jaundice in a masterly manner, though the absence of any illustrations portraying the pathology of the disease is unfortunate. In THE LANCET this week a communication from Noguchi supplies this deficiency. The article on yellow fever is by H. R. Carter, of the U.S. Public Health Service, who gives due recognition to the work in question. Relapsing fevers are dealt with adequately by J. L. Todd; syphilis, like tuberculosis, is a cosmopolitan disease, and William Fletcher, of Kuala Lumpur, gives what is necessarily an abridged account of a very extensive subject. A. Castellani describes yaws in a well-considered article, and R. G. Archibald gives an account of bronchial spirochætosis. Probably the inclusion of this disease as a well-established entity in an authoritative text-book of this description is not altogether wise, as it has by no means been established that the symptoms of bronchitis are brought about by the presence of a spirochæte which in this respect differs from other saprophytic spirochætes, commonly found in the mouth cavity. This section concludes with an article on Rat-bite Fever by C. C. Bass, based upon the recent work of Futaki.

Section X. is devoted to protozoal diseases; C. Dobell writes a noteworthy introduction, and with G. C. Low has presented us with the most lucid and accurate account of amœbiasis extant. The difficult subject of the trypanosomiases is attacked by Blacklock and Warrington Yorke; leishmaniases by R. G. Archibald.

The intestinal flagellates and the fallacious interpretations which may be put upon their occurrence in man are described by Dobell; the same authority is answerable for coccidiosis. Malaria is under conjoint authorship. S. P. James, partly alone and partly in collaboration with S. R. Christophers, gives a general account of various aspects of the disease, while the parasites are carefully described by J. D. Thomson and H. M. Woodcock; malaria surveys are by Allan C. Parsons. We note that blackwater fever has been included frankly as a symptom of subtertian malaria. Chapter LXXVII., on balantidiosis, is by Low and Dobell.

As an addendum to this fine volume we find the sigma reaction of Dreyer and Ward and its application to the diagnosis of syphilis well set out. The coloured illustrations again reach a very high standard, and we would select for special praise the three illustrations of amœbic dysentery by Schwartz-Lenoir, and the delicate plates of malaria parasites by J. D. Thomson. In our review of the first volume we expressed the hope that the high standard set forth would be maintained; this promise has been amply fulfilled.

PSYCHIATRY.

Lehrbuch der Speziellen Psychiatrie für Studierende und Aerzte. Sechste, verbesserte Auflage. Von Prof. Dr. ALEXANDER PILCZ. Leipzig und Wien: Franz Deuticke. 1922. Pp. xvi.+315. M.80.

IN the preface to the sixth edition Prof. Pilcz says that he has adhered to the original purpose of this book, which was written for the general practitioner and the undergraduate. Theory is omitted, individual types of disease are described, and emphasis is laid on the differential diagnosis arising from the symptomatology, on prognosis, and on the discussion of treatment. Of the authorities quoted, the principal one is v. Wagner, Prof. Pilcz's former chief and teacher. No references are given in the text.

This edition takes into account what has been learned during and since the war, and almost every chapter has in consequence received additions and alterations. A few pages about the phenomena of hypnotism have been introduced, as Prof. Pilcz has noticed that while the laity are suffering from an epidemic of hypnotic addiction, many medical students and general practitioners have an unsatisfactory acquaintance with hypnotism. Controversial questions, and some recent results the clinical value of which is still doubtful, have been omitted.

Each class of mental disease is discussed under the usual headings, symptomatology, course, prognosis, differential diagnosis, ætiology, therapy, the practical character of the book being kept up throughout. But the omission of a general introductory section designed to save space would have spared much repetition, and would have given an opportunity for saying something about the early stages of mental disorder, the recognition of which is so important to a practitioner. As to ætiology, stress is laid, as is usual in our own literature, on heredity. In many cases it might be truer, and certainly more practical, to lay stress on environment, as this is more easily modified than heredity. Among the definitions, which are given as chapter headings in spaced type, amentia may be noted, here still used for acute hallucinatory confusion, and paranoia, which is said to be characterised by the chronic progressive development of systematised delusions, hallucinations (especially of hearing) being a constant symptom, while primary anomalies of mood and association processes are absent. Of general paralysis it is said that there are a few cases which must be considered cured. These are usually early cases of manic type, where there are intercurrent feverish attacks, especially suppuration. This gives the lead for treatment. In early cases, when the general health is still good,

remissions of long duration may be obtained by the use of a thorough inunction cure or other anti-syphilitic treatment in combination with other measures. These methods are to be recommended to the general practitioner because as family doctor he is in a position to watch the development of the earliest stages of progressive paralysis. The feared and avoided psychiatrist only sees, as a rule, the advanced cases.

In Austria 20 to 30 per cent. of all admissions to mental hospitals are paralytics. In some parts of Europe—for example, Bosnia—paralysis is extraordinarily rare in spite of the fact that syphilis is widespread and indeed in some districts endemic.

Psychotherapy is given a place, as in the treatment of obsessions; hypnotism may be considered here, but it is not absolutely safe in these cases; most important is to distract attention by an absorbing occupation. Prof. Pilcz adds: "I should like to give a direct warning, founded on personal experience, against the use of 'psycho-analysis.' I know several cases where the condition has been made considerably worse by this procedure; after several years (!) of such treatment the patients do not know how to turn for the crowd of newly awakened doubts and difficulties."

The book is methodically arranged, but speedy reference would be facilitated by the use of page-headings.

HISTORY OF ELECTROTHERAPY.

An Essay on the History of Electrotherapy and Diagnosis. By HECTOR A. COLWELL, M.B., L.R.C.P., M.R.C.S., D.P.H., Assistant Radiologist, King's College Hospital. London: William Heinemann (Medical Books, Ltd.). 1922. Pp. 180. 17*s.* 6*d.*

IN this interesting essay the history of electrotherapy is traced back to the days of the Romans, and the use recorded of shocks from electrical fishes for treatment of various disorders. The author shows that there was no other form of treatment of this nature before the science of electricity was founded by William Gilbert, physician to Queen Elizabeth. The first recorded observation of the use of electricity for a specifically medical purpose is, the author tells us, that of Kratzenstein, professor of medicine at Halle, who applied it for the treatment of a case of palsy in 1743. Among the earliest publications by an English medical man—if, indeed, it was not the first—was one by Dr. Steavenson, physician to the infirmary at Newcastle-on-Tyne, the great-uncle to Dr. W. E. Steavenson, the first medical officer to the Electrical Department of St. Bartholomew's Hospital.

For many decades electrical treatment was regarded with contempt by the medical profession, and quacks flourished. Dr. Colwell gives most entertaining accounts of two of the latter, James Graham and Elisha Perkins. The discovery of the galvanic current by Galvani in 1791 and the work of Volta reawakened interest in medical electricity, but apparently the first serious effort at an English hospital to determine the medical uses of electricity was made at Guy's in 1836, when an electrical department was founded and work was begun by Dr. Golding Bird—father of Mr. Golding-Bird, the well-known consulting surgeon of Guy's Hospital—who died in 1854, still under 40 years of age, having devised a primitive form of induction machine which was described in the Philosophical Magazine of 1837. The discovery by Faraday of the induction of currents, and the work of Duchenne on the use of the faradic current in neurology, marked another epoch in the history of medical electricity, but the study of this branch of medicine was confined to a few pioneer workers, and little real progress was made until the beginning of the present century and the gradual elucidation of the methods of action of electricity on the tissues. The author gives interesting historical accounts of the work which resulted in the establishment of ionisation and diathermy. A short but concise survey of the history of X rays and radium is included in the book, and the development of the indirect uses of electricity—viz., for the illumination of the lamps of the cystoscope and urethroscope—is also described, with an additional note on the history of the electro-cardiograph. The foot-note on p. 11 leaves the reader in some doubt as to who was the first to use the word electricity, whether it was Charleton or van Helmont.

Dr. Colwell is to be congratulated on the result of his painstaking research and the production of an interesting essay on a branch of medicine which has not hitherto received adequate attention from the writers of the history of medicine. The book is profusely illustrated by reproductions of old engravings and portraits of distinguished scientists and physicians of the past, and will be studied with equal interest by the practitioner of electrotherapy and the student of medical history. It is well printed on art paper.

EXPERIMENTAL PHYSIOLOGY.

Third Edition. By Sir EDWARD SHARPEY-SCHAFER, F.R.S., Professor of Physiology in the University of Edinburgh. London: Longmans, Green and Co. 1921. Pp. 132. 6*s.*

Experimental physiology cannot be properly taught in this country; the same laws that make the teaching of operative surgery a mere rattling of dead bones, compel the physiologist to base much of his practical instruction on the twitchings of pithed frogs. Of course there are demonstrations on live animals which teach the student a good deal, but these cannot replace the first-hand knowledge or the manual skill he would acquire by doing them himself. To some extent the decapitated cat introduced by Sir Charles Sherrington can be used by the student, but this involves a good deal of labour on the part of the teaching staff who must do the preliminary operation. Sir E. Sharpey-Schafer's book represents, we think, in a clear manner all that the average teacher of physiology can undertake, and, from the student's point of view, is clear and well-balanced. Some of the instruments illustrated are seldom used nowadays; for instance, Marey's myographic forceps, Fick's spring kymograph, or Marey's sphygmograph; these could, with advantage, be replaced by some more modern instruments. The use of the terms "chalonic" and "hormonic" for "inhibitory" and "excitatory" is to be deprecated, as it may lead to confusion.

In view of the fact that this book is well got up, and has 90 illustrations, its price is exceptionally moderate.

COLLOID CHEMISTRY OF THE PROTEINS.

Part I. By Prof. Dr. WOLFGANG PAULI, Director of the Laboratory for Physico-Chemical Biology, University of Vienna. Translated by P. C. L. THORNE, M.A.Cantab., A.I.C. London: J. and A. Churchill. 1922. Pp. 140. 8*s.* 6*d.*

THE application to the proteins of the results of the researches on colloids which have been the fruit of the past few decades has proved of great interest and value. In Prof. Pauli's hands especially the subject has grown to considerable proportions, and few other investigators can be so competent as he to present the modern views in this field. This English edition, upon the excellence of which the translator may be congratulated—for it contains the ideas, and not the mere literal translation of the text—shows what many-sided progress has been made since the publication of the fundamental investigations of Hardy less than twenty years ago. To these and several other English investigations due credit is given, but the important work of Prof. C. J. Martin and Miss Harriette Chick should have been noticed. The subject is not approachable without a good working experience of colloids and some knowledge of physical chemistry. Indeed, the physical chemistry of the salts of proteins with acids and bases provides three particularly tough chapters, and here the complexity of the matter dealt with probably has

hampered the translator. The tables are taken from original papers; there are 72 of these, many of them extracted from the works of the author and his collaborators.

To those engaged in research work in any way related to the subject the book will be an invaluable guide; to the (all too few) senior students likely to have the necessary equipment to digest it, it will prove stimulating; to many it can never be more than a collection of awe-inspiring mysteries.

JOURNALS.

JOURNAL OF PHYSIOLOGY. Edited by J. N. LANGLEY, Sc.D., LL.D., F.R.S. Vol. LVI., Nos. 3 and 4. Cambridge University Press. 1922. Pp. 125–268. 12s.—Studies in the Physiology of Capillaries: III., The Innervation of the Blood-vessels in the Hind Legs of the Frog, by A. Krogh, G. A. Harrop, and P. Brandt Rehberg.—The Localisation of Excretion in the Uriniferous Tubule, by J. M. O'Connor and E. J. Conway. The authors made various calculations as to the number, average length (20 mm.), diameter, and capacity of the tubules, and number of glomeruli in an entire rabbit's kidney (55,000), and the estimated contents of the uriniferous tubules was taken as about 120 c.mm. Certain substances were injected intravenously in anæsthetised rabbits and reached the kidney in seven seconds. The urine was collected in drops from a cannula placed in the ureter, and it was assumed after calculation that a substance excreted by the second convoluted tubule would appear in the third or fourth drop after the injected substance reached the kidney, but a substance excreted by the glomerulus only would not show itself until the eighth or ninth drop. Three substances were injected usually in a large quantity of water. The suggestion in the authors' plan is that as a substance excreted by the convoluted tubule would join the urine lower down in its course than if excreted through the glomerulus it would have to expel a smaller quantity of "dead space" urine than if excreted by the glomerulus, and the approximate calculations of these "dead spaces" are given. The intravenous injection of sodium chloride suggests that while sometimes excreted by the tubule, it is in other cases excreted by the glomerulus alone. Similar experiments with uric acid injected in a solution in phosphate go to show that it is excreted by the second convoluted tubule, while sodium iodide is generally excreted at a higher level, probably by the glomerulus, a view confirmed by the injection of uric acid and iodide together.—Glucose Absorption in the Renal Tubules of the Frog, by G. A. Clark. A freshly prepared fluid containing certain salts—Ringer's fluid—and varying amounts of sugar was perfused through the renal arteries. The experiments were designed to ascertain if the renal tubule played any part in preventing the blood-sugar from passing into the urine. It was found that the glomerular membrane is completely permeable to glucose, even when the latter is present in the blood below the "threshold value." The epithelium of the renal tubules has the power to absorb glucose from the glomerular filtrate up to the normal "threshold value." This absorption is possible until the capillaries surrounding the tubules contain glucose at a concentration nine or ten times that normally present in the blood. In the absence of calcium, the renal tubule loses its normal activity. No concentration of the glomerular filtrate by absorption of water occurs in the frog.

The Secretion of Sweat. Part II., Effect of Vaso-Constriction and of Adrenaline, by J. N. Langley and K. Uyeno.—The Relation of Nerve-supply and Blood Flow to Sweating produced by Pilocarpine, by J. H. Burn. It is known that the action of pilocarpine on the sweat glands of the cat's foot is not dependent on the integrity of the nerve-supply. Young kittens were employed, and the soft pads of their feet sweat readily when pilocarpine is given subcutaneously. Into the loose skin of the flank 0·5 mg. of the nitrate was injected, and the paw operated on was closely watched for 8–10 minutes in comparison with the corresponding normal paw. Pilocarpine produces secretion of sweat by a direct action on the gland cell, and not indirectly by an action in the nerve-endings. Degeneration of the sympathetic nerve-supply is not followed by diminished response to pilocarpine of the sweat glands in the cat's foot. On the contrary, the sweating is often increased. Degeneration of the whole mixed nerve supplied to the limb is accompanied by exaggeration, but usually, after a variable longer period, by a diminution of the sweating evoked by pilocarpine. The changes in secretion following either sympathetic or complete denervation are closely parallel to changes in the vaso-dilator reaction of the limb to histamine. Associated with greatly diminished response of both kinds, trophic changes in the skin are observed. It is suggested that all three changes are due to defective peripheral circulation, following degeneration of sensory fibres. The altered response to histamine seems to indicate that the defect is due to a failure of the normal tone of the capillary blood-vessels. The sweating response to pilocarpine, depressed after complete denervation, can be temporarily restored by subcutaneous injections of adrenaline, or by a period of anæsthesia with ether.—The Metabolism of the Salivary Glands, II., by G. V. Anrep and R. K. Canaan. Certain nerves were divided, blood and saliva collected and analysed, and blood pressure measured. It was found that in every case the resting submaxillary gland consumes blood-sugar. The mean rate of blood-sugar consumption varied in 15 experiments from 0·8 to 2·9 per gramme of gland per hour, being fairly constant for any one experiment. Atropine does not change the blood-sugar consumption of the resting gland. Pilocarpine increases it. The increase in sugar consumption per 1 c.cm. of saliva secreted varied in eight experiments from 0·7 to 2·7 mg. The average figure per 1 c.cm. of saliva secreted was 1·5 mg. per gramme of gland per hour.—Observations on Augmented Salivary Secretion, by G. V. Anrep. The author explains an observation made by Langley in 1889 on the dog that the sympathetic nerve when it is stimulated shortly after the cranial nerve produces a brief rapid secretion from any or all of the salivary glands. This "augmented secretion" is not due to an increased irritability of the salivary gland to impulses reaching it by the sympathetic nerve. It may be due to an emptying of the gland of stagnant saliva caused by a narrowing of the ducts either by their own contractility, or from a contraction of tissues around the alveoli.

Salt and Water Elimination in Man, by M. M. Baird and J. B. S. Haldane. The salt ingested was either 38 g. NaCl, 29·25 g. + 12·6 g. $NaHCO_3$, or a mixture in which K, Ca, and Mg were present in about the quantities found in plasma. As long as the total amount of water drunk was less than 3 litres, the rate of water excretion was entirely independent of the amount taken. Excess salt is mainly stored in the tissues—skin and subcutaneous tissues—along with far less water than is needed to dilute it to isotonicity. The process of storing is a fairly slow one, and when once stored it is not readily liberated again into the blood. The effect of large water ingestions is partly a water diuresis and partly œdema of the depôt tissues, whilst the excretion of salt is very slow. The diuresis produced by drinking hypertonic salt solutions is independent within wide limits of the amount of water ingested. Salts are less mobile within the body than water.—The other papers include the effects on the Circulation of Changes in the Carbon-dioxide Content of the Blood, by H. H. Dale and C. Lovatt Evans.—Acid Production in Shed Blood, by C. Lovatt Evans.—On the Hydrogen-ion Concentration and Some Related Properties of Normal Human Blood, by J. Barcroft, A. V. Bock, A. V. Hill, T. R. Parsons, W. Parsons, and R. Shoji.—Formation and Distribution of Phosphates in Muscle, by L. B. Winter and W. Smith.

Reports and Analytical Records.

(1) TABLOID CHENOPODIUM OIL CAPSULE; (2) TABLOID BENZOIC ACID (EUCAINE) COMPOUND.

(BURROUGHS, WELLCOME AND CO., SNOW HILL BUILDINGS, LONDON, E.C.1.)

1. We have received from this firm a specimen of Tabloid Chenopodium Oil Capsule which has recently been adopted as a remedy in the treatment of hookworm disease, while it is regarded by many as a specific in the treatment of round worms. Hitherto the value of the drug has been obscured by its variability in quality, a fact which is probably due as much to the locality in which the plant is grown as to the care or absence of care, exercised in distillation; for apparently in certain localities the anthelmintic agent is contained in the oil in lesser proportions. In the new tabloid the inactive or deleterious ingredients of the natural oil have been eliminated, while care has been taken that the composition should be constant, so that the same dose presents the same amount of active principle. Tabloid chenopodium oil (capsule) is supplied in boxes containing 25 capsules, and is issued in strengths of 3, 5, and 10 mins.

2. Tabloid Benzoic Acid (Eucaine) Compound is similar to tabloid benzoic acid compound with the exception that cocaine hydrochloride is replaced by the hydrochloride of eucaine. The other ingredients are benzoic acid, codeine, menthol, ipecacuanha, oil of peppermint, and red gum. The new tabloids are said to retain the stimulative, expectorant, and anodyne properties of the original formula, and it is thus possible to obtain these effects in cases where it is undesirable to prescribe cocaine. It is further claimed that the benzoic acid (eucaine) compound should be of value in relieving the irritation associated with various forms of pharyngitis, smokers' throat, &c.

(1) "PERKENOL" MEDICINAL POWDER; (2) "PERKENOL" DENTIFRICE TABLETS.

(CHAS. ZIMMERMANN AND CO. (CHEMICALS), LTD., 9 AND 10, ST. MARY-AT-HILL, LONDON, E.C. 3.)

We have examined these "Perkenol" preparations with the following results:—

1. *Medicinal Powder.*—On dissolving one part by weight of the powder in four parts of water a solution is obtained containing 3 per cent. of hydrogen peroxide (H_2O_2), which confirms exactly the claim made on the label. Boric acid (as borate) is also present, and the preparation is free from sugar, percarbonates, persulphates, and insoluble matter.

2. *Dentifrice Tablets.*—These tablets when dissolved in water (1:4) yield a solution containing 2·3 per cent. of hydrogen peroxide. The tablets were completely soluble in water. Sugar was absent, but the evolution of carbonic acid suggests the presence of a certain amount of percarbonate. The principal constituent is, however, sodium perborate.

The medicinal powder and dentifrice may both be regarded as useful and convenient forms of applying neutral hydrogen peroxide, the valuable antiseptic properties of which have been abundantly testified to in recent medical and surgical practice.

CONTRAMINE.

(BRITISH DRUG HOUSES, LTD., GRAHAM-STREET, LONDON, N.1.)

CONTRAMINE is diethyl-ammonium diethyl-dithiocarbamate, the formula of which appears to be $SNH_2(C_2H_5)_2$ CSN $(C_2H_5)_2$. It is a white crystalline substance soluble in water, 1 in 2·5. It does not undergo change on exposure to air. For therapeutic purposes it may be injected intramuscularly or intravenously, or it can be used as a local application. The indications for its use in early syphilis and other conditions were set out in THE LANCET of April 15th, pp. 733 et seq. In intramuscular use the average dose is 0·25 g., but 0·5 g. can be used without risk. The contents of a tube or of two tubes should be added to 1·5 c.cm. up to 3·0 c.cm. of cold sterilised water or normal saline. The crystals dissolve readily and the solution should not be heated. In intravenous use the dose is 0·25 g., this quantity being dissolved just before use in 10 c.cm. sterilised normal saline containing 10 per cent. of pure glucose, the addition of which is recommended as obviating transitory nausea in the patient. Locally contramine has been found of value in chronic ulcerations, and cases of its successful use in this way have been recorded in THE LANCET.

BARCLAY'S LAGER BEER.

(1) BARCLAY'S LONDON LAGER, "DOCTOR" BRAND, "LIGHT"; (2) "DOCTOR" BRAND "LAGER DE LUXE."

(BARCLAY PERKINS AND CO., LONDON, S.E.)

Two samples of this beer have been submitted to us. When analysed the following results were obtained:—

	1. "Light."	2. "Lager de Luxe."
Original gravity	1052°	1057°
Present gravity	1010·3°	1017·4°
Alcohol by volume (per cent.) ..	5·37	5·1
Proof spirit (per cent.)	9·35	8·9
Extractives (per cent.)	4·66	6·35
Acidity as acetic acid (per cent.)	0·09	0·11
Colour (Lovibond ½ in. cell) ..	6°	47°

Both these beers, which are stronger than the continental lagers, were brilliant, in excellent condition, and contained no sediment. They possess the true lager characteristics, are most palatable and refreshing beverages, and have evidently been brewed with the greatest care and skill. Messrs. Barclay are to be congratulated on their enterprise in placing a true "lager" on the market, the more so as such beers are held in great esteem by beer-drinkers with a "refined" palate who can appreciate a sound and wholesome beverage brewed by a method hitherto but little exploited in this country. Medical men may have every confidence in recommending these beers as they are fully fermented and matured.

SCHWEITZER'S COCOATINA.

(FLETCHER, FLETCHER AND CO., VIBRONA LABORATORIES, LONDON, N.)

This well-known preparation was examined by us as far back as 1888,[1] and again in 1905.[2] As might be anticipated from improvements made in the manufacturing process, the analytical results are somewhat different. We now find the cocoa has the percentage composition: Water, 4·14; total ash, 7·44; ash soluble in water, 5·4; alkalinity of soluble ash as K_2O, 1·97; fat, 25·4; protein, 21·6; crude fibre, 4·4. A consideration of these figures will show that the cocoa contains no addition of shell, sugar, or starch. The cocoa has been treated with alkali in course of manufacture, but to a less extent than is usual with most preparations on the market. It is distinctly a high-grade product, and its claims to purity are amply supported; moreover, it is very evenly and finely ground and produces a good emulsion in the cup.

LITMOPYRINE TABLETS.

(ALFRED BISHOP, LTD., 48, SPELMAN-STREET, LONDON, E.)

The manufacturers have sent us a sample of their tablets of soluble aspirin, and in producing this drug in a soluble form they have certainly removed restrictions to its usefulness in actual practice. The tablets contain 4·9 gr. per tablet of lithium acetyl salicylates and dissolve rapidly and uniformly. They are free from any impurity and form a convenient method of administering aspirin, whose value in many therapeutic directions is well known to the medical profession.

[1] THE LANCET, August 25th, 1888. [2] Ibid., Jan. 7th, p. 48.

THE LANCET.

LONDON: SATURDAY, JUNE 17, 1922.

The Continued Drought.

WE have on several occasions[1] dealt with the great drought of 1921 in its relation to water-supplies and health. It will be remembered that the year 1921 concluded with a deficiency of 9·88 inches (14·59 instead of 24·47 inches, 60 per cent. of the average, Camden-square). Droughts of almost equal intensity characterised the years 1854, 1864, 1870, and 1887. Unfortunately, the months of October, November, and December, 1921, which should, on the average, have yielded 2·63, 2·36, and 2·39 (total 7·38) inches, only gave 0·63, 2·01, and 1·13 (total 3·77) inches, or less than half the usual amount. These months and the first two months of the year are the ones which are of most importance from a waterworks point of view, as later on the luxuriant growth of vegetation, high temperature, rapid evaporation, and parched ground militate against even heavy rain reaching the subterranean sources of water-supply. The year 1922 opened not inauspiciously. Thus, the rainfall for January and February was 2·81 and 2·20 inches, as against normal averages of 1·86 and 1·67 inches. March was less satisfactory, the rainfall measuring 1·51 instead of 1·83 inches. April gave promise of better things, the rainfall being 3·02, instead of 1·54 inches, and the month was very cold. But these hopes were rudely shattered in May, the rainfall only amounting to 0·83, instead of 1·76 inches, and the temperature was phenomenally high. The total rainfall for the first five months of the year was thus 10·37, as compared with 8·66 inches, the deficiency of last year being thus reduced only from 9·88 to 8·17 inches. The first half of June has already gone without real relief in the matter of rainfall. The future outlook is extremely uncertain, and the position may become one of considerable gravity if the pressure distribution which characterised 1921 persists during the present year.

The daily press has taken up the matter with enthusiasm, but although we welcome all that lays stress on the urgent necessity for economy in the use of water, it is unfair to make capital out of the misfortunes of waterworks authorities. Many of the things that have been said, for example, about the Metropolitan Water Board, would not have appeared in print if the facts had been known. Possibly the Board have relied too much on the good sense of those who really understand the history of the undertaking, who know the true reasons for the delay in completing Littleton reservoir, and who are conversant with the basis for the amended water charges. On these matters an authoritative public statement is much to be desired, but on one point we may reassure London readers. Whatever the future has in store for us as regards *quantity* of water, there never has been a time in the whole history of London's water-supply when more attention was paid to questions of *quality*. In the report of the Departmental Committee appointed to inquire into the provisions and effect of the Metropolis Water Act of 1902 the following passages occur with reference to the new Water Examination Department, supervised by the Water Examination Committee:—

"It is the duty of this Department to watch the quality of the water at various stages in its passage through the Board's works, and there is a routine system of examination of the waters so as to ascertain that they do not fall below the high standard of purification which the Department has set for itself. Sir Alexander Houston, who gave evidence before us, explained the processes which have been initiated for testing the water and for securing its wholesomeness. He has made a number of Reports to the Board on scientific aspects of water-supply, and they are no doubt of value not only to the Water Board, but to other bodies charged with supplying large populations. The results of his investigations into methods of chlorination, the filterable qualities of various types o water, &c., have not only been valuable from the point of view of health, but have enabled the Board to save considerable sums of money.

The Water Examination Department works in close coöperation with the Engineering (Works and Stores) Department, and there can be no doubt that it plays an important part in securing the health of the population supplied with the water. We are impressed with the breadth and thoroughness of the work performed by the Department. In Sir Alexander Houston's hands, and under the control of the Water Examination Committee, it has been developed to a much higher standard of excellence than it attained under the Companies and the quality of the water has appreciably improved."

At the moment we counsel our readers to have patience and place their trust in the Ministry of Health and those responsible for safeguarding our water-supplies. But all should act on the advice set forth in THE LANCET of Jan. 21st, and here repeated. "It would be well if every citizen, quite independently of what the skies may send us in the shape of rain, snow, or hail, considered that a state of drought continued to prevail until authoritative statements to the contrary are forthcoming. . . . The main thing is for each individual to continue to economise in the use of water by the methods which experience has already taught us, and, if possible, to devise new plans for conserving a commodity, the value of which has only been brought home to us by the bitter lesson of adversity. It needs to be remembered that in most cases no amount of expenditure could possibly be in time to retrieve the situation created in 1921 if it persisted in 1922, even to a moderate extent." Waterworks authorities may be trusted to do their utmost to conserve water and to ensure its purity, but it is the bounden duty of each consumer to exercise the strictest economy lest worst things befall. And a few wet days will not set right a serious difficulty.

[1] THE LANCET, August 13th, 1921, Jan. 21st, and March 4th, 1922.

The Bacteriology of Dental Caries.

THE interesting paper by Prof. JAMES MCINTOSH, Mr. WARWICK JAMES, and Dr. LAZARUS-BARLOW on dental caries and bacteria, which appears in our present issue, is a valuable addition to knowledge of the ætiology of this disease. On the bacteriological side it represents a distinct advance, for whereas before bacteria could only be implicated as providing the source of the acid which destroys the calcified tissues of the teeth, without specifying the organisms involved, we now appear to be within measurable distance of knowing definitely the precise nature of the bacterial agents in the process and the conditions under which they work. The brilliant researches of W. D. MILLER, which stand out the more conspicuously in proportion as we discover more of the

various aspects of dental caries, showed very clearly that the carbohydrate foodstuffs provided the pabulum from which the lactic acid responsible for the destruction of the teeth was derived, and also that the chemistry of the process was due to bacterial agency. Since then research has been chiefly devoted to the dietetic aspect of the disease, and the labours of Dr. SIM WALLACE have resulted in much valuable addition to our knowledge. On the bacteriological side the advances have been slower; though attempts to implicate a special organism as the cause of the acid formation have failed, yet research has steadily advanced in the direction of isolating certain organisms from the abundant flora of the mouth as being more directly concerned in the production of dental caries. The work of P. R. HOWE in 1917 represented a considerable advance, for he was able to show that the Moro-Tissier group was constantly present in dental caries. He did not conclusively demonstrate their ætiologic rôle, but pointed out that more nearly than any other organisms did they possess the attributes for inaugurating the process of dental caries.

At this point the work of MCINTOSH, JAMES, and LAZARUS-BARLOW carries on the knowledge a stage further; the two organisms they have isolated in a very large percentage of cases resemble the organisms described by HOWE, though differing in certain cultural reactions. Their careful and ingenious technique appears to leave no loophole for error, and shows very clearly that they are fully cognisant of the complexity of the problems to be solved. It may be premature to assert the specificity of the microbic agent in dental caries—much more work needs to be done before that is possible, but at least a clear pathway of research is opened up through the cumulative endeavours of past and present workers in this field. The importance of elucidating the problem of dental caries lies in its application to the prevention of the disease rather than to its treatment. The latter depends on mechanical removal of infected dentine and enamel, the shaping of the cavity in accordance with certain physical principles, and the filling of it with a watertight plug. Though a better understanding of the pathology of dental caries may not be without its influence on conservative dentistry, it is hardly likely that it will materially modify it. On the other hand, the prevention of dental caries is entirely dependent on a correct pathology. At present the principles of preventive dentistry are based almost entirely on the dietetic factor in caries. Dr. SIM WALLACE allows no significance to the structure of the dental tissues. Yet, considered theoretically, it is obvious that since the carbohydrate pabulum and the bacteria which can turn it into lactic acid are the two necessary elements in the production of dental caries, its incidence might be lessened by dealing with the bacterial factor as well as by attempting to eliminate carbohydrate stagnation. If there were many organisms in the mouth capable of causing acid formation, then the possibility of influencing the incidence of the disease by altering the mouth flora might not be feasible, but if there are only one or two organisms possessing this power, then such a method of attack on dental caries might be conceivable. At any rate the possibility of enlisting another weapon in the campaign against dental caries should be borne in mind. It must also be remembered that the further study of these acid-forming organisms, with reference to the conditions which favour or inhibit their growth, and whether all forms of carbohydrate food are equally fermentable by them, may have a repercussive effect on knowledge of foodstuffs in their relation to dental caries, and so enable us to formulate the principles of prevention with greater surety. We look forward with interest to further instalments of a piece of research which offers many and valuable possibilities.

The National Health Insurance Bill.

THE recent debate in the House of Commons on the second reading of the National Health Insurance Bill was not reassuring. In some ways it confirmed the fears which we have already expressed. Indeed one speaker declared that the approved societies intended to call the tune if they were called on to pay the piper. Underlying the whole debate there was a current of hostile criticism of the panel system, which led Sir ALFRED MOND in his reply to say that he had yet to learn of a better one. This criticism was couched in the vaguest terms. A prominent member in the insurance world spoke as follows:—

"If there is one benefit more than another under National Health Insurance which has caused us consternation and feeling, and which has created difficulty, it is the administration of medical benefit. We are asked to shoulder a burden of £1,760,000 per annum in relation to a benefit which we think ought to be materially improved. I wish to say that if that benefit cannot be improved and if it is going to continue in the future as it has been in the past, we should be glad to get rid of it altogether and to make other arrangements to safeguard the rights of our members and to obtain medical benefits for them."

If this remarkable statement is to be taken seriously some pertinent inquiries must be made. What is meant exactly by the administration of medical benefit? We had thought this was in the hands of insurance committees, themselves composed largely of approved society officials. Is it the quality of the present benefit which requires improvement, or did the speaker refer to an elaboration of medical benefit? Lastly, what are the rights of insured persons which need safeguarding, and what exactly are the medical benefits which the societies suggest may be obtained for them under some alternative system?

While definition of the terms here used is urgently required, more urgent still is the necessity for full inquiry into the working of medical benefit. If "consternation" really exists to any great extent among approved society officials, surely it is the duty of the Ministry of Health to set up a committee of inquiry without delay. We note, however, that in the *National Insurance Gazette* for June 3rd exception is taken to the "strong remarks" we have quoted above. "There are indifferent doctors," the article runs, "but they are relatively few," adding, "the doctors as a whole are giving a square deal" and "doubtless the chief deficiencies are in the large cities." It is self-evident that the personnel of the Insurance Medical Service cannot be altered by regulations. The standard of medical efficiency is in other hands and is independent of the panel service. The officials of approved societies can hardly be unaware that such criticism and such an attitude on their part must result in preventing the Ministry of Health from securing the coöperation of the best type of practitioner. Many of these men are irritated and alienated by such petty restrictions as the societies would institute. So long as the approved societies stress details and miss the important factors of adequate provision they cannot expect the best coöperation of scientific men.

Hope is expressed in the *Gazette* that the societies and the doctors will pull together when the time

comes to consider the new agreement. But before this can happen there must be a better understanding on the part of the societies as to what constitutes medical benefit. The doctors cannot forgo their prerogative as advisers in questions of health, both personal and communal. Any other relationship is clearly impossible. We are greatly concerned that the approved societies should secure the hearty coöperation of the medical profession. The time for this effort is not at the end of 1923, but here and now. If consultations could be arranged at once—and we believe that conferences are being set up in certain areas—these would lead to enlightenment on both sides. The objects of the societies should be clearly stated, spheres of operation precisely defined, and common ground of action discovered. Talk about "gifts" and "concessions" must be dropped if a great scheme of medical benefit is to be developed on proper lines. The present Bill is clearly a temporary measure to tide over a period of economic pressure, but it is not without its own dangers and pitfalls, and unless carefully administered it will harass still further a service which has already had much to bear. Unless a bold policy of development is adopted much of the money expended will simply be thrown away. When, it may be asked, is the scheme for additional benefits to be made universal? When is hospital provision to become part of medical benefit? It would surely be to the advantage of all parties if surplus funds could be administered centrally for the further development of the insurance scheme along lines which we have repeatedly indicated.

Applied Physics in Medicine.

THE Bi-lingual Congress of Radiology and Physiotherapy, held last week in London and briefly reported on another page, will, we believe, mark another mile-stone in medical progress, for it stands for the application of physical science to the needs of the living human organism. The activities of this organism are, as Sir WILLIAM BAYLISS reminds us in his Robert Boyle Lecture,[1] essentially manifestations of the change of energy from one form into another, and the corollary is justified that any gain in our knowledge regarding this change of energy will give us a fuller understanding of the living activities. Now, it is noteworthy that although the Congress was made up chiefly of medical men and women—Belgian, French, and British—it was largely concerned with the physics of radiology and electrology and hardly any of the speakers referred to their apparent successes or to their failures. It was a meeting of technicians—we might almost say of applied medical physicists. Such a meeting was indeed foreshadowed in 1913, when a section of the International Congress devoted to radiology drew prominent workers from all over the world. It is significant of the growth of these subjects that this Congress, confined practically to what Sir HUMPHRY ROLLESTON called the Channel countries, should have drawn an audience over three days that, so far as we recollect, was fully double that of 1913. The organisation was the joint work of the Electrotherapeutic Section of the Royal Society of Medicine and of the British Association of Radiology and Physiotherapy. The hospitality of the Royal Society of Medicine lent an admirable building to the Congress, the President of the Society undertaking the presidency of the Congress.

[1] Life and the Laws of Thermodynamics. Being the Twenty-fourth Robert Boyle Lecture delivered before the Junior Scientific Club of the University of Oxford on June 7th, 1922, By Sir W. M. Bayliss, F.R.S. Oxford University Press. 1s.

In the Section of Radiology three subjects were down for discussion: the normal stomach, the abnormal stomach, and deep therapy by X rays and radium, the last being allotted three full sessions. This proved to be the most burning topic of the Congress, and led to the expression of widely divergent views. It was generally admitted that great progress had been made in the measurement of X rays, due largely to the use of the ionto-quantimeter, an instrument that owes its origin to France. This had enabled workers to give and to measure enormously heavy doses at a depth below the skin, and although cures were claimed in a large number of cancer cases, a note of warning was repeatedly sounded that as yet the results did not justify the deduction that surgery should in this respect give place to radiotherapy. On the whole, the Congress was sceptical of the claim of German workers that there is a definite lethal dose which, if it can be delivered to the cancer cell, will destroy it. There were some also who cast considerable doubt on the statement that irradiation short of the lethal dose causes irritation and consequent stimulation of the growth. Occasional apparent cures of cancer were known to X ray workers employing radiations falling far short of the present intensive therapy.

The discussion on the normal stomach, of which our knowledge has been enriched by Dr. A. E. BARCLAY and the Manchester School, was introduced by a series of beautiful dissections of the musculature. It was shown that the oblique fibres form a definite band along the lesser curvature, probably acting as a sling to take the weight of the food in the organ; and a considerable body of evidence was adduced suggesting that this band of fibres is capable of acting independently of the rest of the stomach muscle, which is mainly responsible for tonic action and peristaltic movement. This disposes of any idea of a fixed shape to the normal stomach, the differences met with, apart from pressure from without, being due to alterations in tonic action. The relative value of screen examination and serial radiography (involving the use of a number of photographs in each case) in the diagnosis of gastric lesions brought forward the opinion that with modern apparatus and reasonable care there is little or no risk to the competent observer, while it appears that radioscopic palpation, carefully carried out and supported by a few plates, would yield more accurate results than any method depending solely on plates. On these lines some speakers claimed a degree of correct diagnosis well within 10 per cent. of absolute accuracy. In the Section of Physiotherapy the treatment of cardiac disorder by physical methods was considered by Prof. J.-A. BERGONIÉ, of Bordeaux, who showed exactly by means of radiograms how the heart responded to the use of such appliances as the well-known Bergonié chair. In the Section of Electrology, Dr. G. BOURGUIGNON, of Paris, occupied a session in discussing electrical methods of diagnosis and prognosis in paralysis, his main theme being a consideration of chronaxia, which can be shortly described as the tonic factor in the movement of a muscle by a nerve. He showed how and why the utilisation of this method eliminated the personal element.

At the conclusion of the Congress a small committee was formed to make arrangements for holding a similar gathering next year in Paris. Its success will be assured if it secures the same devoted service as was given to the London Congress by the secretary-general, Dr. STANLEY MELVILLE, and those associated with him.

Annotations.

"Ne quid nimis."

THE HOSPITALS OF LONDON: COMBINED APPEAL.

His Majesty the King has addressed a letter to the Organising Committee of the Combined London Hospital Appeal, laying stress upon his personal and family interest in the progress of the Fund now being organised, and pointing out that the happiness of the Prince of Wales, President of King Edward's Hospital Fund, will be much increased, on his return home, by learning the good results which have already been achieved.

This week the Organising and Executive Committee of the Appeal are pointing out in a forcible circular the influence which the medical profession in the metropolitan area might have, if they commended the movement to their patients when the opportunity arose. As every private patient of every medical man has benefited by the hospitals in their capacity as centres of research and practice, there is no difficulty in pointing out that all patients, of whatever class and denomination, have a direct interest in maintaining these institutions at their present high pitch of excellence, and in providing the funds necessary for further extensions.

Next Sunday is Hospital Sunday.

THE CASE OF RONALD TRUE.

WHEN the Court of Criminal Appeal refused to allow the appeal on behalf of Ronald True, sentenced to death for the murder of Gertrude Yates, the Lord Chief Justice pointed out that, apart from any legal issue that might be decided by that court, the Home Secretary had certain powers which, in suitable cases, were exercised. The Home Secretary, called upon to decide whether the death sentence upon True should be carried out, caused an inquiry to be held with regard to the convict's mental condition by medical experts, who according to the official announcement, unanimously certified the convict to be insane. As a result True was reprieved with a view to his removal to Broadmoor Criminal Lunatic Asylum. The points raised at True's trial and at the subsequent appeal with regard to the trial of prisoners alleged to be insane have already been fully discussed in THE LANCET,[1] and the decision of the Home Secretary takes the question no farther. The decision does not imply that the Home Secretary considers the decision of the jury at the trial, or the summing up of Mr. Justice McCardie, or the judgment of the Court of Appeal to have been in any way wrong according to the law, or that the result was due to a state of the law that is harsh and unjust. The reprieve, followed by confinement in Broadmoor, appears to mean only that in the Home Secretary's opinion, based upon that of his medical advisers, and according to the precedents which guide his actions, it is undesirable to hang for murder a man who otherwise would be rightly confined in a lunatic asylum. The execution of a murderer is, no doubt, carried out partly as a deterrent to others, but it must be regarded as in part punitive, and it is not reasonable to inflict "punishment" upon one whose mental state prevents him from appreciating the fact that he is being punished. It would be equally unreasonable and inhumane to flog an insane person for robbery with violence, or for a breach of asylum discipline. We do not understand from the terms in which the respite has been announced that the Home Secretary's action has any bearing upon whether the rule in McNaughton's case ought still to be applied strictly, or whether it should be reconsidered and enlarged as suggested by Mr. Justice McCardie's summing up. The law with regard to insanity remains where it was, and the question is, therefore, open whether judicial and medical opinion in the present year 1922 would lay down for the guidance of a jury the same test or standard of mental capacity that was agreed upon by the judges who advised the House of Lords in 1843. Lastly, it is almost unbelievable that reasonable persons should try to compare the case of Jacoby with that of True, howsoever poignantly pity for the fate of a youth may appeal.

[1] THE LANCET, May 13th, p. 954, and June 3rd, p. 1107.

THE KIDNEYS IN BLACKWATER FEVER.

IN the *Archiv für Schiffs- und Tropen-Hygiene* for January, Dr. Gaetano Salvioli reports on a histological examination of 13 kidneys from cases of blackwater fever that he has made in the Tropical Medicine School at Hamburg. He used Miller's method of staining hæmoglobin with some alterations. He never found hæmorrhages, red-blood corpuscles, malarial parasites, or pigment; blackwater fever does not appear to cause nephritis, though it sometimes occurs in persons whose kidneys have been inflamed. The hæmoglobin is excreted in solution, and in the region of the glomeruli and the convoluted tubules. The loop tubules are distended with granular debris, which as it passes on strips off the lining epithelium mechanically, leaving the basement membrane. The epithelial cells thus removed show no cloudy swelling or other evidence of inflammation or degeneration. In the hæmoglobinuria of acute arsenical nephritis, on the other hand, acute nephritis is present, while in the kidneys of yellow fever, though the casts are very similar, they never give the iron reaction. Thus these diseases may easily be differentiated. The journal has extended its title this year, describing itself not only as a record of naval and tropical hygiene, but also of the pathology and treatment of exotic diseases.

THE SUFFERINGS OF RHODESIAN MAN.

THE last discovered fossil skull, found in 1921 at the Broken Hill Mine in Rhodesia, and now safe in the Natural History Museum, South Kensington, is a remarkable one. Not only does it furnish several curious problems to the anthropologist, but it holds a unique position among prehistoric remains in showing pathological conditions of teeth, ear, and knee. Investigation of the dental and aural conditions was entrusted by Dr. Smith Woodward to Mr. Sidney Spokes and Mr. Macleod Yearsley respectively, both of whom are keenly interested in the study of prehistoric man. Mr. Spokes has found widespread caries of the teeth, with evidence of extensive alveolar abscesses. These are associated with a condition of the upper end of the tibia suggesting chronic arthritis, and presumably the result of chronic oral sepsis. We believe that we are correct in stating that no such phenomena have been met with before in a skeleton of the age of the Rhodesian specimen, which is considered provisionally as belonging to the late Pleistocene period.

Besides the dental disease, there is a lesion of the mastoid process which is of great interest, the more so because, about two inches above the auditory meatus there is a perforation, 10 mm. in its greater diameter, of the squamous bone. This hole, apparently the result of a blow from some sharp implement, shows evident signs of having undergone considerable natural repair. It has been suggested that it is an example of primitive "trepanning," but the fact that its internal opening exceeds the external by 2 mm. negatives such a conclusion, and a comparison with the trepanned skulls in the Wellcome Museum bears this out. Behind the auditory meatus is a large opening in the mastoid, measuring 10 mm. in its vertical and 15 mm. in its horizontal diameter. This is deeply excavated, with pitted (? carious) walls, and communicates with the cells in the tip of the process, which is of the pneumatic variety. The mastoid tip itself is perforated, the edges of the deficiency being

pitted, and those of the partitions dividing the cells noticeably rounded. An examination of the interior of the meatus shows that the posterior tympanic spine and outer attic wall are missing, a significant point which may, however, be due to the cleaning away of the matrix in which the skull was embedded. But these appearances are not all that can be found. Extending from the upper boundary of the hole in the mastoid is a pitted, roughened track which passes across the temporo-zygomatic ridge, at the weakest part of the attachment of the temporal fascia, on to the squama to a distance of 7 mm. below the wound described above, and then turns forward, narrowing to a point. This track measures 9 mm. at its mastoid commencement and 5 mm. opposite the perforation in the squama. The bone between the perforation and the track is smooth and normal, suggesting no connexion between the two.

The hypothesis suggested by Mr. Yearsley to account for these remarkable appearances is that this unfortunate Rhodesian man experienced a train of circumstances which are not without modern parallel. The subject of chronic oral sepsis for a period sufficient to start arthritic changes, he probably suffered from a septic condition of his tonsils and pharynx which resulted in middle-ear suppuration. The ear condition extended to the mastoid and the mastoid abscess perforated the cortex first near the base of the process. Unable to track downwards because of the strong muscular attachments in a prehistoric male of stout build (he must have been nigh to six feet in height), and heavy skull, the pus turned upwards at the weakest point of the temporal fascia, in the line of least resistance, and burrowed beneath the temporal muscle, turning forward where the tissues surrounding the wound in the squama were thickened pathologically. Later, the mastoid abscess burst through the tip after the manner of a perforating mastoiditis of Bezold and, escaping under the neck muscles, caused the death of this prehistoric patient, who thus succumbed to a condition which was not to be described by surgeons until chiliads after his decease.

EXPECTATION OF LIFE IN THE U.S.A.

REFERENCE has been already made [1] to the forthcoming issue of the United States Life-Tables [2] for the years 1890, 1901, 1910, and 1901–10; and the appearance of the volume is an important event in the history of vital statistics. It demonstrates how rapidly America is travelling towards the goal of accurate vital statistics and of their skilled interpretation. Most readers will be chiefly interested in the main inferences deducible from the tables, rather than in their method of construction. Briefly stated, they show that during the two decades, from 1890 to 1910, the death-rates declined both among men and women of all ages under 50, but that after this age the death-rates have remained practically stationary. As might be anticipated, there are wide variations in the rates of mortality in different classes of the population: as a rule also the expectation of life is more favourable for women than for men, for rural than for city populations, for whites than for negroes, and, at most ages, for the native-born than for the foreign-born. This is the rough outline of results, but the various tables deserve study in detail, and serve to elucidate many interesting points in the vital history of the maelstrom of races and nationalities who are very gradually becoming "100 per cent. Americans" in the United States.

Perhaps the most interesting feature of the American statistics is the failure to secure a lowered death-rate at ages over 50 years. When Dr. Ogle's English life-table for 1871–80 was published, a closely similar result emerged for this country, and there was much discussion as to the causes of this failure of the older ages to participate in the increased expectation of life. Much play was made of the assumed effect of survival to these ages of a larger proportion of damaged lives—the result of interference with natural selection, of improved medical and surgical science, and of sanitation in its widest sense. Others, more wisely, advised the necessity of waiting for two more decades before coming to the conclusion that the improvement already secured was of doubtful value, indicating increase in quantity in survival to middle life, but a decrease in the quality of the health of survivors. And one writer went so far as to suggest that in two or three decades the improvement already evident would have extended to higher ages, as soon as the crops of children surviving to these higher ages had been born in the more hygienic "post-sanitary" years from 1870 onwards. That this forecast was correct is shown by the figures published in Dr. Stevenson's supplement to the Registrar-General's report for 1901-10, and in the tables published in the official English life-tables for the same period, prepared by Mr. George King. Improvement is now shown *at all ages* and in both sexes, when recent are compared with earlier decennia, the improvement encroaching steadily on an increasing number of the later years of life as decade follows decade. It is interesting to contrast our favourable position with that in the American life-tables; there can be little doubt, that, in accordance with a suggestion recently published, America will repeat English experience in future improvement at the higher ages. For the present the experience of the native American population is rendered less favourable by the large introduction of inferior types of population from Eastern and Southern Europe, whose earlier life has been lived under unfavourable social and sanitary conditions.

For the student of vital statistics this volume will be of outstanding value, especially the sections devoted to a non-technical description and explanation of life-table functions, and a good series of illustrative questions and answers. The long series of graphs illustrating the various life-table functions and comparing different sections of the United States are also most valuable.

[1] THE LANCET, April 8th.

[2] Prepared by James W. Glover, Expert Special Agent of the Bureau of the Census, Washington. Government Printing Office. 1921.

FILARIASIS IN THE WESTERN PACIFIC.

THE incidence of filarial infection and its manifestations display considerable variation in different groups of islands in the Western Pacific. Manson-Bahr, in 1910, showed that in non-periodic filariasis prevailing in the Fiji Islands, the insect host of the filarial larvæ was *Stegomyia pseudoscutellaris*, and that the distribution of this type of filariasis lay to the north of the Bismarck Islands, whereas further south, as in North Queensland, the periodic *F. nocturna* was found. At a recent meeting of the Royal Society of Tropical Medicine and Hygiene, Dr. F. W. O'Connor gave an account of the results of researches undertaken during 1920 and 1921 among the Polynesian natives of the Samoan, Tokelau, and Ellice groups of islands. *S. pseudoscutellaris* was verified as the most important carrier of filarial infection in these islands. The close relationship between the prevalence of this mosquito and the amount of filariasis was established, and also the non-periodicity of the micro-filarial invasion of the blood stream. In the Ellice group where stegomyia was abundant, the micro-filarial incidence yielded an average rate for the nine islands of 67·3 per cent. for males and 55·9 per cent. for females in 1169 of both sexes out of a total population of 3000; the elephantiasis rate amounted to 8·5 per cent. in 1417 examined, the proportion of males affected being nearly double that of females. In one island, Nui, the percentage of infected males was as high as 83·8, and of cases of elephantiasis, 21·2. Among the Tokelau islanders, however, numbering 1000 in the four islands of the group, Dr. O'Connor saw no cases of elephantiasis, and found the incidence of blood infection to be only 41·6 per cent. among males, and 33·3 per cent. among females. In the Samoan group,

out of a total of 2500 natives examined in eight of the islands, 66·6 per cent. males, and 50 per cent. females were found to be infected; elephantiasis was relatively uncommon with a rate of 5 per cent. males and 1·5 per cent. females among 3500 inspected.

The Ellice and Tokelau groups are composed exclusively of lagoon or swamp coral atolls of varying size, and the extent of their vegetation is confined to irregular patches of cocoa-nut palms and jungle growth dotting the circle of coral reef. The greater density of bush and shelter afforded to the stegomyia, in contrast to the more open and wind-swept character of the islands of the other group, explains the marked mosquito prevalence and consequent high rate of filarial infection existing in these islands. There, too, in consequence of the freer pollution of the bush enclosing the villages, the incidence of ankylostomiasis and other helminthic infections of the bowel are correspondingly higher than in the other island groups. The principal breeding haunts of stegomyia Dr. O'Connor found to be in the heaps of waste cocoa-nut shells and in the holes excavated in the tree trunks by the natives for the purpose of collecting rain-water. Though filariasis is not at present curable, measures of prevention by destruction of the recognised breeding places of stegomyia, and clearance of sheltering jungle and bush growth in the cocoa-nut palm plantations, would obviously go far to check the spread of infection.

In the discussion following Dr. O'Connor's paper, it was suggested that the non-periodic character of filariasis, prevailing in the islands of the Western Pacific, possibly represented a separate form of filarial disease, to be further distinguished from that caused by *F. nocturna* by a well-defined geographical distribution and certain clinical features, notably the absence of chyluria and the frequency of enlargement of the epitrochlear gland. Moreover, although no anatomical differences have hitherto been demonstrated between the parent worms and the microfilariæ of *F. nocturna* and the non-periodic variety, yet the contrast in the intermediary insect hosts and in the feeding habits of *Culex fatigans* and *S. pseudoscutellaris* in which the filarial larvæ of the two forms respectively undergo development, seems to warrant the definition of distinctive types of filarial disease.

CANVASSING BY A PANEL PRACTITIONER.

AN Inquiry Committee of the Ministry of Health, composed of a barrister as chairman and two medical men, recently investigated the case of A——, a practitioner on the medical list of the London Insurance Committee, against whom it was alleged that he had canvassed for his benefit panel patients, with the object of inducing them to transfer to his own list, obtaining from them their medical cards to enable him to make the transfer. It was further alleged that he filled up and signed transfer forms in the name of B——, to whom he was acting as assistant, without authority to do so. The Local Medical Committee took the view that anyone who wrongfully obtained medical cards and caused patients to be wrongfully transferred to his own list was acting prejudicially to the medical service of the insured. It appeared that at the time when criminal charges lay against practitioner B, for whom A was acting, a list of B's insured persons disappeared, and from this list A's wife compiled a directory of insured persons made out by streets in the district. Subsequently three persons called on a number of patients included in B's list. At the inquiry a number of witnesses deposed to attempts, successful or unsuccessful, to obtain their medical cards from them. The Inquiry Committee, however, found the position of the respondent exceptional, and such as to render difficult a strict application of the rules and duties enjoined by ordinary medical etiquette, in view of the fact that he expected the reversion of B's insurance practice, but failed to secure it. But what the Committee regarded as serious was the fact that, after knowledge of the practical results of his canvassing, A did not return the insurance cards which he had collected, at a time when B's successor was effectually carrying on B's practice. In so doing A ratified in a sense his wife's earlier efforts on his behalf. The Committee, while censuring A, did not regard the evidence before them as showing that the interests of insured persons had suffered in consequence of his acts, and did not therefore recommend his removal from the panel list. At the same time they disclaimed any deduction that canvassing from a general point of view might not be prejudicial to the interests of insured persons, if only for the reason that it would tend to deprive them of the free choice of a doctor contemplated under the regulations.

The decision of the Inquiry Committee may be equitable as far as concerns the immediate patients, but the London Panel Committee is undoubtedly right in strongly deprecating anything in the nature of touting or canvassing. Had the complaint been made to the General Medical Council and not to the Ministry of Health the penalty might have been severe. It may be difficult to show in a particular case that canvassing is detrimental to a group of insured persons, but the general consensus of medical opinion has long ago decided that canvassing is detrimental not only to professional relations but also to the best interests of the patients themselves. The decision which we have quoted will not, we feel sure, result in any less stringent view being taken of the ethics of canvassing.

THYROID FEEDING AND SECONDARY SEXUAL CHARACTERS.

SOME interesting experiments upon the physiological relation of certain ductless glands to the secondary sexual characters in fowls are recorded by H. B. Torrey and Benjamin Horning, of the University of Oregon.[1] It is known to zoologists that the males of several breeds of fowls—notably Sebright bantams and Campines—are feathered so like the females as to be in this respect practically indistinguishable from them; and that such hen-feathered males, following castration (especially in early life), develop plumage of the usual male type. The appearance of cock-feathering in normally hen-feathered males is now familiar to zoologists. The authors describe experiments that led to a similar transformation but in just the opposite direction—viz., to the appearance of hen-feathering in cock-feathered males of ordinary breed. The experiments were made on 80 Rhode Island Red chicks all of the same hatch. They were divided into four equal lots, both male and female, one set was castrated between two and four weeks after hatching and the other was unaltered. Four weeks after hatching, one lot of castrated birds and one lot of normal birds at the beginning of the experiment received daily doses of dried thyroid (50 mg.) by the month. The dose was increased until, at the end of 15 weeks, it had become 350 mg.—a dose the birds were able to take without any disturbance of their normal health. In the sexes of this breed of fowls the tail coverts begin to show themselves in about six weeks after hatching. Five weeks later they were developed on the normal females, in both thyroid and control lots, but they had not appeared on the control males, either normal or castrated. The absence of the tail coverts proved a ready recognition mark of the male. The hackles on the neck characteristic of the male bird only, though less conspicious, appeared at this time. In sharp contrast with these hackled and tailless males were the thyroid-fed normal males, the latter, with well-developed comb and wattles, male in carriage and instincts; they were unquestionably female in plumage, owing to the absence of hackles and the presence of well-developed tail coverts. The sex was confirmed when they were killed four weeks later. The thyroid-fed males in behaviour, comb, wattles, and spurs were

[1] Proc. of the Soc. for Expt. Biol. and Med., March, 1922.

male, in feathering female. It was clear that the addition of thyroid to the diet of unaltered males was somehow responsible for this condition. As to the castrated birds that had been subjected to thyroid feeding, it would seem that the gonad is a necessary factor in the result, for not a single castrated bird of either sex showed the least evidence of thyroid feeding in any of the characters previously enumerated. The thyroid-fed castrated females, like their castrated controls, approximated males in feathering. The thyroid-fed castrated males exhibited the ultra-male plumage characteristic of capons. The authors discuss the organic mechanism through which thyroid feeding achieved its effect, having special reference to the "lutear cells" present in the ovary of the hen, and in the testis of hen-feathered Sebright birds. If the appearance of hen-feathering in normal males as a consequence of thyroid feeding is dependent on the presence of lutear cells, the question still remains as to the nature of the relation between thyroid and lutear tissue.

TRAINING OF HEALTH VISITORS.

THE shortest course of training for health visitors provided for in the regulations of the Board of Education lasts for a year and this is intended for women who already possess substantial knowledge or experience. As a rule, no student may be admitted to this course unless she is a hospital nurse with three years' training or has acted as a health visitor for three years, or alternatively has obtained a University degree or its equivalent. As a matter of fact, since the regulations were published in 1919, few trained nurses have entered for this shortened course, and it now appears that nurses who have already devoted three years or more to professional training are often unable on financial or other grounds to devote a further year to training as health visitors. Moreover, in a number of hospitals the training for nurses now includes instruction in certain subjects of the course prescribed for health visitors, and it is hardly necessary to require nurses so trained to spend a whole year in full-time preparation for the further certificate. In these circumstances the Board of Education has announced its willingness to approve whole or part-time courses of less than one year's duration at recognised institutions for trained nurses who have had a three years' course of general hospital training or a full course of training at a children's hospital, and these shortened courses will also be open to women who have acted for three years as health visitors in the service of local authorities and who are willing to take a short refresher course. Institutions which have not hitherto made arrangements for the training of health visitors, but which now desire to establish one of the shortened courses, are invited to forward schemes for consideration by the Board of Education. No grant will be payable in respect of students who take a course shorter than one year.

SUBMUCOUS LIPOMA OF THE STOMACH.

THE extreme rarity of lipomata developing in this situation is commented upon in a recent paper by H. Verger and C. Massias in the *Journal de Médecine de Bordeaux*. The authors here briefly review the seven cases recorded in the literature, adding details of a case of their own. The patient, an alcoholic woman of 58, gave a history of slight jaundice with transient right hemiplegia two months previously, and of nausea and diarrhœa with progressive loss of weight for one month. Abdominal palpation disclosed no signs of tumour; the liver was not enlarged; there was no free hydrochloric acid in the gastric juice either after fasting or after a test-meal; nor were there any signs of hypersecretion, stasis, or hæmorrhage. Radioscopy showed nothing abnormal save some irregularity in the outlines of the upper portion of the stomach, and pyloric insufficiency. The Wassermann reaction was negative. The diarrhœa proved intractable; the patient became increasingly cachectic, and finally died, the post-mortem showing adipo-cirrhotic changes in the liver, with some sclerosis of the kidneys. Upon the greater curvature of the stomach, 5 cm. from the pylorus, there was a tumour the size of a hazel-nut, smooth, sessile, non-ulcerated, and moderately firm in consistency. This proved histologically to be a pure lipoma situated in the submucous tissue between the muscularis mucosæ and the muscular coats, neither these nor the mucous coat showing any histological changes.

PROF. HARVEY CUSHING'S VISIT.

Prof. Harvey W. Cushing, who delivered the Cavendish lecture on Meningiomas last Tuesday evening before the West London Medico-Chirurgical Society, returned to America the next day, after acting for a fortnight as Director of the Surgical Unit at St. Bartholomew's Hospital. Some years ago, when the Peter Bent Brigham Hospital at Boston, Mass., was founded in association with Harvard University, arrangements were made for exchange of visits by distinguished foreign surgeons, the visiting surgeon to be temporary surgeon-in-chief in place of Prof. Cushing for some period in each year. Prof. G. E. Gask deputised at Harvard in the spring of 1921, and Sir Cuthbert Wallace has just returned from filling a similar office. Although recognised as the leading neurological surgeon in the world, Prof. Cushing did not operate while he was in this country, but spent his time in observing methods of instruction, talking to students, and teaching in the out-patient and casualty departments of the hospital. His association with British surgeons during the war and the knowledge then acquired of the ways and manners of British sick and wounded made it possible for him to enter at once fully into the life of an English hospital. Our own surgeons envied Harvard its abundance of surgical assistants and its organisation of typewriting clerks and dictaphones to mitigate the labours of record keeping. It would be interesting to know what impression the great American surgeon formed from his intimate visit here. At all events, he has left a pleasant impression behind him.

WORMS AS AN INDEX OF CIVILISATION.

IT is not often that the presence of intestinal worms is an indication of efficiency and progress. But such may be the case, as Dr. W. G. Smillie[1] points out from his studies in South America. He finds that in the older, more backward areas of Brazil almost the only hookworm found to-day is *Necator americanus*, while in the districts which are active and progressive and have good colonists the proportion of *Ankylostoma duodenale* is much greater. *Ankylostoma* is, indeed, an index of progress. The explanation of this bizarre situation is found in the history of South American labour. The original home of *Necator* appears to have been Central Africa, from which it has been carried to Ceylon, India, and the East Indies, and, with the slave trade, to North and South America. The early development of agriculture in Brazil was effected by negro slave labour. With the end of slavery in 1887 new conditions arose, and with the extension of the coffee industry colonisation on a large scale began from Southern Europe; in more recent times there has also been an influx from Japan. The natural haunts of *Ankylostoma* extend from Southern Spain, through Italy, Egypt, Persia to China and Japan, and the more advanced travellers have brought with them their own worms as well as their superior capacity for progress. Labourers and worms alike are aliens; an energetic campaign of the International Health Board should go far to break up their old association.

[1] Monographs of the Rockefeller Institute for Medical Research, No. 17, 1922.

THE CONGRESS OF RADIOLOGY AND PHYSIOTHERAPY.

A CONGRESS was held in London at the House of the Royal Society of Medicine, from June 7th to 10th, with the intention of facilitating the interchange of knowledge and experience between the British workers in radiological science and their French and Belgian colleagues. In order to familiarise visitors to the Congress with the merits of British-made apparatus in radiological work, an exhibition was held simultaneously at Surrey House and Torrington-place, London, at which all the leading British firms in this specialised industry were represented; a collection of skiagrams was also on view. The Congress was divided into three sections, each of which sat for three days, and a number of interesting discussions were held, the proceedings being bi-lingual throughout.

SECTION OF RADIOLOGY (June 7th).

Dr. THURSTAN HOLLAND, the President of the section, briefly opened the Congress and called upon Mr. G. JEFFERSON (Manchester) to open a discussion on the

Normal Stomach.

In a paper which was much appreciated, Mr. Jefferson remarked that it was 14 years since it had been realised that the shape of the stomach as hitherto described by anatomists was incorrect. The anatomists had described with considerable accuracy the stomach as seen in the dissection- and post-mortem rooms, often altered by the introduction of formalin. The radiologist with an entirely new method of investigation was able to correct the many inaccuracies of prevailing descriptions. At first an attempt was made to standardise the normal stomach, but it was soon realised that no such uniform standard was possible. The normal stomach was found to possess wide limits in its shape and contour, and to have a range of normality in its position. The mistake was made by some of the early writers of regarding the stomach as an inert viscus whose size and shape depended largely on its relationship to its neighbours. The essential form depended rather on its muscle tone and upon its powers of contraction. There was nowhere in the body a more beautiful example of the fact that an anatomical structure is laid down for a definite physiological purpose. Previous descriptions of the musculature were of little value either to the radiologist or physiologist because dissections had been made and drawings planned with the views wrongly oriented. Any discussion of form or shape per se, without reference to tone of muscular walls and amount and character of its contents as well as the stage of physiological action viewed, must be barren and without benefit. Mr. Jefferson referred to work of his own on the canalis gastricus, showing that fluid entering the stomach could not be controlled by mucous membrane without definite muscular action by the stomach itself. He found no valve at the cardiac end of the stomach such as has recently been described. In an excellent series of lantern slides Mr. Jefferson showed the external coat of the stomach to be composite and largely derived from three sources: (1) œsophagus, (2) duodenum, and (3) fibres arising from the stomach itself. While the direction of this coat is largely longitudinal it would be more accurately described as a coat following the longitudinal axis of the stomach. In a slide of a careful dissection of a large perforating ulcer it was interesting to note that the oblique coat alone was unaffected. This latter coat he regarded as a ligamentous sling supporting the stomach.

Dr. P. COLOMBIER (Paris) emphasised a definite position to the normal pylorus. He appealed for a standardisation of the opaque meal used in clinical examinations.

Dr. PEREMANS (Antwerp) differentiated the normal stomach from the X ray or barium-mealed stomach. He, too, was an advocate of the internationally standardised barium meal. He thought no radiologist should conduct a stomach examination without previous and complete clinical and pathological reports. He said that his custom was to screen in the upright position, using a spoon for palpation. The hyper-, hypo-, and ortho-tonic stomachs were variations of one normal but the atonic stomach was pathological.

Dr. A. E. BARCLAY (Manchester), in reviewing the scant attention previously paid to the normal stomach, compared with the pathological variety, suggested the great importance of the diagnosis of disordered physiology. He had made plasticine models from shadows of normal stomachs and as a result described three varieties: (1) the J-shaped, (2) the steer-horn, and (3) the fish-hook types. He regarded these as common variations in tonic action. Atony he regarded as impairment of tone rather than absence of tone. Following Sherrington, tone was defined as a posture of muscle in which the action of gravity was balanced and the tubular shape of the stomach maintained. Gastroptosis was normal in the long thin type as was the hypertonic stomach in the short thick type. Atony, on the other hand, seldom caused a dragging on the duodenum as the lesser curvature was not increased. The Sherrington view was maintained that the cardiac end acted as the hopper, the pyloric portion of the stomach as the mill. Tonic action and peristalsis were different functions. Hour-glass spasm and "cup and spill" stomach arose from the fact that the oblique muscular band was unattached to the circular fibres which became thinned out. These phases could be seen experimentally by inflation with CO_2.

In the afternoon session Sir ARCHIBALD REID opened a discussion on the

Abnormal Stomach

by referring to the two prevailing methods of barium meal examination—i.e., the maximal and the minimal screening schools. When one considered the great recent increase in this branch of X ray practice, it became obvious that screening should be used as little as possible. He mentioned the general malaise and tiredness, also the chronic diarrhœa and anæmia which followed exposure to radiation. Moreover, patients had been known to suffer burns as the effect of prolonged screen examination.

Dr. GILBERT SCOTT, on the other hand, relied solely on palpation, which had given him the greatest satisfaction during the past three years. He had been unable to demonstrate small duodenal ulcers by the radiographic method. He gave four essential rules for safety: (1) Use a fixed distance viewing screen 30 inches from tube; (2) use the smallest amount of current (one or two milliampères); (3) keep the examination as brief as possible; and (4) use a very small field of vision. It was essential to procure a really good fluorescent screen. Dr. Scott thought the clinical history of the patient of no importance, and that the rate of emptying of the stomach was unreliable. In all cases of stenosis the lesion should be demonstrated.

Dr. J. H. D. WEBSTER described the causation of cascade stomach; some of the examples given by him in support of his theory would hardly have been accepted by other workers as characteristic "cup and spill" stomachs.

Dr. BARCLAY agreed with Dr. Scott that palpation was desirable, but thought the saddle-shaped ulcer on the lesser curvature near the pylorus was difficult to detect, and needed radiographic examination.

Dr. L. A. ROWDEN thought there should be no difficulty in noting ulcers at the cardiac end of the stomach if the patients fed themselves with an opaque meal in the horizontal position. He used the radiographic as well as the radioscopic methods of examination.

Dr. E. I. SPRIGGS thought radiologists should have few working hours and long holidays. Their blood should be regularly tested for anæmia each month. He was sure that a skilled radiologist could see very much more than any surgeon could possibly detect without actually opening the stomach, and the profession as a whole would have to realise this fact.

Deep Therapy by X Rays and Radium (June 8th).

Dr. CASEMAN (Antwerp) opened the discussion on this subject. He said it must never be forgotten that radiation could not be used when pathological cells became less sensitive than normal cells. He thought the "cross fire" method unnecessarily limited the field of radiation. He suggested the use of a rectangular diaphragm with a wide field and a dose sufficient to destroy the entire neoplasm. Slides showed graphs giving X ray absorption at different depths from the skin. For example, using 160 kilovolts with a certain filtration, 30 per cent. of the surface applied energy was available at a depth of 10 cm.; while using 220 kilovolts under identical conditions 48 per cent. of the energy applied could be used at the same depth. It was therefore necessary for economy to use high voltage currents. In the determination of the X ray exposure required it was necessary to know the depth of the pathological centre and the dose required by it. The biological unit generally accepted was that amount of radiation which would produce on normal skin a slight erythema in a few days followed by a mild pigmentation in six weeks. The radiation at any given depth depended partly on the "back scattering" and therefore on the nature of the irradiated tissue. Roughly speaking, water and human tissue behaved similarly to radiation when the pelvis was considered, but this would not be true for the thorax. The radiosensitiveness of irradiated tissue was a very difficult factor to determine.

Dr. R. KNOX thought the time opportune for the standardisation of the dosage of radiation. It would be advisable when speaking of the therapeutic action of rays to speak of wave-length rather than hardness. If the voltage required to produce a specific wave-length were ascertained we should have the basis of a system of measurement which would be incomparably better than any in use at the present time. The aim should be to associate an effect upon a particular tissue with a particular wave-length. The most troublesome factor in technique was still the skin factor. It was so delightfully simple to talk of 110 per cent. of the erythema dose as the lethal cancer dose, and if even a moderate percentage of truth existed in the statement it would be a great discovery, and we should soon be in a position to deal satisfactorily with a large percentage of cases of cancer. The problem was too deep and elusive to be solved so easily. The Erlangen method differed so far as actual technique was concerned in having six skin areas, each being directed to a definite deep area. Both the Freiburg and Erlangen methods in which the fields were limited and in which several were used for deep-seated carcinoma of the pelvic organs necessitated a considerable overlapping of the beams and a considerable risk to adjacent and healthy organs. The effects on the blood would have to be more carefully considered. The work at the cancer hospital had resulted in the construction of a rotating tube method in which the maximum dose was delivered at a predetermined spot, the skin receiving but a fraction of the depth dose. It was later found necessary to modify the method by slowly rotating the patient instead of the tube, so that efficient protection could be determined. An ingenious centring accessory was fitted and designed by Dr. Harvey. Dr. Knox thought the erythema on the skin a most unsatisfactory factor from which to base an estimation of the effects on deeper structures. It was well known that many forms of carcinoma required three or four times the so-called "lethal" dose before any change could be induced in the morbid process. In radiation we possessed a useful aid in the treatment of malignant disease, particularly for the amelioration of suffering and the relief of symptoms. All efforts should be made to carry on the investigations into the biological reactions induced by its application.

Mr. SAMPSON HANDLEY called for close coöperation between radiologist and surgeon, who were interdependent. As a pathologist he wished again to draw attention to his previous demonstration of a narrow growing edge visible by means of the microscope considerably beyond the visible signs of disease. Malignant disease undoubtedly spread in the plane of the deep fascia and not in the skin. This both called for wider fields of treatment and added to the difficulty of getting a lethal dose at the required depth. There was always to be remembered the possibility of the microscopic growing edge receiving a stimulating dose of radiation when much harm might be done. Radium tubes were advocated when placed beyond the growth (encirclement method). Similarly, lupus was not a true skin disease but spread in the deep fascia. The lethal dose was required there and naked-eye manifestations of the skin should receive less consideration.

Prof. DAELS showed some excellent microphotographs illustrating the action of radiation on malignant growth.

Mr. HAYWARD PINCH regarded deep radium therapy to mean treatment with a screen of not less than 1 mm. silver, which would eliminate 99 per cent. of the β rays. There were three methods of deep radium therapy: (1) heavily screened external applicators; (2) buried radium (salt or emanation); and (3) combination of methods 1 and 2. The first method was wasteful but obviously necessary in mediastinal growths and tumours of the cerebellum, for example. It was further advisable in malignant disease of the thyroid and of the parotid gland if any secreting gland remained. With regard to buried radium tubes, if the growth were not greater than 3 cm. in diameter, one tube with 1 mm. silver filtration of suitable size and shape should be used, otherwise several small tubes. Wherever possible the afferent vessels and lymphatics should in addition be radiated with surface applicators. As adjuncts to radiation, Mr. Pinch suggested (1) a liberal vitamin B diet, as this lessened the lymphopœnia. This suggested the addition of yeast or marmite to the diet. (2) Intramuscular injections of colloidal copper or silver solutions. Lastly, radium should always be assisted by X rays.

Prof. S. RUSS explained that the problem of treatment by radiation was one involving three variables: (1) radiation applied; (2) tumour sensibility; and (3) body resistance. He was experimenting with the last factor and trying to determine in animals the extent to which the body resistance could be modified by the tumour the animal carried.

Dr. N. S. FINZI spoke to emphasise the rôle of scattered radiation upon which we depended so largely, especially with hard radiation and big fields. Human tissues did not behave as an equal amount of water in this respect. With the Wehnelt interrupter a larger proportion of harder radiation was available than with the mercury break. The wave form would therefore appear important. If surgical interference was adopted it should never be used until six weeks after heavy radiation.

Dr. ANDERSON advocated the application of lard or cold cream to skin areas subjected to radiation.

No description of this section would be adequate without mention of the two associated exhibitions of X ray apparatus and radiograms at Torringtonp-lace and Surrey House. Messrs. X Rays, Ltd., showed much enterprise in their comprehensive selection of instruments, all of which were actually working. The centre of attraction was their deep therapy set, admittedly a great advance on continental instruments. Some exceedingly good radiograms were taken and much ingenuity shown in a new portable outfit. At Surrey House, too, visitors acquainted themselves with the productions of other British firms. To name but a few items: Fredk. Butt and Co. made an excellent show of coils and protected apparatus, the Solus Co. produced a novel screening stand, Watsons their Ionostat, and the Cox Cavendish Co. specially demonstrated their Impex plate.

Discussion on the Uses of Electrical Methods in the Diagnosis and Prognosis of Paralysis (June 8th).

Dr. BOURGUIGNON read a paper on the testing of the electrical reactions of muscles and motor nerves. He showed that the determination of the chronaxie gave far more accurate indications of the condition of these tissues than the customary methods. He described a method of measuring the chronaxie in which condenser discharges were used. He also described a method of determination of the chronaxie of sensory nerves. By this means it seems possible to obtain a measure of the degree of departure from normal sensory nerves. Dr. Bourguignon's communication was of great value and represents the research which he has been conducting during the past years at the Salpétrière Hospital. This will be published in full in the proceedings of the Congress.

SECTION OF ELECTROLOGY (June 7th).

The Action of the Direct Current (constant) on the Tissues in Health and Disease.

The opening paper of a discussion on this subject by Dr. LAQUERRIÈRE and Dr. CHAILLIOT (Paris) was read by Dr. BOURGUIGNON. The authors stated that the constant current produced on the tissues two kinds of phenomena, physico-chemical actions and physiological reactions which resulted from these. The physico-chemical effects led to transformations of electric energy into other forms of energy—viz., chemical, thermogenic, light producing, and mechanical. The thermogenic, light producing, and mechanical actions of the galvanic current on the organism were not used in therapeutics. The physico-chemical actions relate either to cataphoresis or electrolysis. After a brief description of the phenomena of cataphoresis and of those occurring in the polar and peripolar regions in electrolysis, the authors described the inter-polar actions in these terms. "If the action of the constant galvanic current on the tissues is considered at a point removed far from the electrodes it appears that with the therapeutic doses used and on account also of the diffusion of the current in the organism, the chemical reactions at a distance may be little appreciable; each cell loses a cation in one direction, an anion in the other; but they are replaced by similar anions and cations coming from neighbouring cells. Nevertheless the changes of ions from cell to cell and the phenomena of cataphoresis are susceptible of being produced, can modify the cellular nutrition and explain the trophic action of these currents." Virtual poles existed at the surface of separation of the organs and perhaps of the cellular elements. Weiss had further proved that it is possible by means of appropriate apparatus not only to show but even to measure the current of polarisation of the organism. According to Leduc all the physiological and therapeutic effects of the continuous current were due to electrolysis. Trophic actions might in part be attributed to improvement in the circulation, but there was in addition an action on the cellular respiration. "The exchanges of the ions from cell to cell, the modifications by cataphoresis of the fluid medium, either inter- or intra-cellular, the changes of osmotic tension at the site of the membranes and of cellular envelopes resulting from phenomena of electrolysis and cataphoresis: explain how the exchanges become easier and more intense."

The Action of the Constant Current with Special Reference to its Action in the Inter-polar Path.

Dr. W. J. TURRELL said that in dealing with the constant or interrupted galvanic current four points have to be considered. (1) The relative velocity of the hydrogen ion compared with other ions. (2) The dependence of the strength of an acid upon its hydrogen-ion concentration. (3) The non-conductivity of living cells. (4) The ability of acids and alkalis to produce their characteristic effects without entrance into the substance of the cell. When an electric circuit was suddenly established there was a rising concentration of hydrogen ions in the neighbourhood of the negative pole. Since the strength of an acid depended on its hydrogen-ion concentration there must be a rise in acid reaction in the cells in the neighbourhood of the negative pole. Again, since the living cell was a non-conductor of electricity, but could be acted on by acids though they might be unable to permeate the impenetrable membrane which rendered it a non-conductor, it might be inferred that the stimulation of the cells in the neighbourhood of the negative pole, which took place at make of the current, was the result of this hydrogen-ion concentration. The muscular contraction excited at the negative pole on abrupt make of electrical current was thus directly due to sudden concentration of hydrogen ions in the neighbourhood of that pole, and this sudden concentration could only occur as the result of the relatively high velocity of the hydrogen ion. If the electrical current remained constant in intensity this concentration was almost immediately annulled or neutralised by the arrival of hydroxyl anions. Ionic equilibrium was thus so quickly established that the hydrogen-ion concentration was only of momentary duration. When this equilibrium had taken place that which we call constant current was established in the inter-polar path of the source of supply. The therapeutic action of the constant current had been much obscured in the past by the misapplied term ionisation and by the adoption of the erroneous theory of "ionic medication." He gave some reasons for doubting the truth of this theory, and went on to say that such drugs as salicylic acid, commonly employed in this method, needed to be present in considerable amount in order to exercise their therapeutic effects, and it was difficult to conceive that such drugs in the infinitesimal quantities which could possibly be introduced by ionic medication could have any beneficial action. Current was conveyed through the body by the tissue ions; after the introduction into the body of the foreign ion the current had no further appreciable influence upon it. In support of the theory of ionic medication some workers had claimed better results when using the solutions of certain drugs than when employing a simple solution of sodium chloride for moistening the application pads, although the milliamperage in both cases had been the same. The explanation probably was that the ions of the drugs so employed were of lower velocity, and consequently a higher potential had to be employed to obtain an equal milliamperage, hence greater counter-irritation of the skin resulted, and was possibly attended, ceteris paribus, with better results. Once within the tissues, it was surprising how simply the therapeutic action of the constant current could be explained. It was simply the effects of the heat generated, in accordance with Joule's law, deeply in the tissues throughout the inter-polar path by the passage of millions of ions colliding on their journey with the undissociated molecules, and also the stimulating effects of the non-conducting cells of the tissues resulting from their bombardment by these ions—a result identical in principle with that obtained from the application of diathermy, though differing from it in intensity and in the fact that it was the result of an unidirectional and not an oscillating current of high frequency.

The Physiological Action and Therapeutic Uses of High-Frequency Current (June 10th).

Dr. E. P. CUMBERBATCH opened the discussion on this subject. After considering the action of high-frequency currents on the tissues, he described cases in which cauterisation by diathermy effected cure after other methods had failed. These cases included endothelioma, rodent ulcer, and nævus of the nasal mucous membrane accompanied by repeated and severe bleeding. He showed that the quickness of the operation, its simplicity, and the absence of unpleasant after-effects warranted the further trial of the method in early cases of malignant growth. He advised its trial for treatment of lupus. Soft non-contracting scars were produced. With regard to non-surgical diathermy, Dr. Cumberbatch recommended the use of the latter for the pain and spasm associated with

hæmorrhoids. Cases of gonococcal arthritis responded extremely well to diathermy of the joints if marked fibrosis had not taken place. Gonococcal orchitis and epididymitis accompanied by pain and swelling were greatly relieved by diathermy, and cures appeared to have been effected. Cases of endocervicitis and urethritis in the female due to gonococcal infection have been treated by diathermy in the Electrical Department of St. Bartholomew's Hospital during the past two years, and in the major number of cases the organisms which were found before the treatment were not discovered afterwards.

A paper by MM. RONNEAUX and LAQUERRIERE (Paris) was read by Dr. BOURGUIGNON. The authors stated that an action common to all methods of application of the high-frequency currents was that they were not perceived by the organism. They were only appreciated by the heat produced or by the shock of the sparks. Another property of the high-frequency currents was their inhibitory action. It was probable that if their frequency were too considerable for them to have their influence on the physiological ensemble which composed a nerve, they could nevertheless act on the elements constituting this nerve. After the application of high-frequency current in the neighbourhood of a nerve it was necessary to increase the intensity of a galvanic or faradic current to provoke a contraction. In the same way sensibility was decreased. A third property was the inhibition which explained the antispasmodic action of certain local applications and also certain circulatory modifications. General applications of medium tension were those given by means of the condenser couch, the auto-conduction cage, and certain applications of the spirals of Guilleminot. The knowledge of the physiological results of this mode of application were almost entirely due to D'Arsonval. He had shown that the number and amplitude of the respiratory movements were increased. He showed that the quantity of heat given off by a man placed in an auto-conduction cage was nearly double. D'Arsonval and Charrin had proved an increase of elimination of extractives of urea in particular and of urinary toxicity. High-frequency currents were regulators of nutrition. Clinically, a number of authors had proved lowering of blood pressure, appreciable by the sphygmomanometer, sometimes considerable in cases of hypertension. Clinically, the condenser couch and the autoconduction cage could restore the general condition, raise the strength and energy, improve the circulation, revive the appetite, improve sleep, restore spirits and working ability. Circulatory troubles in arthritics —viz., flushings, congestive attacks, coldness of extremities benefited by the same treatment. In gout not only the lessening and disappearance of the attacks could be obtained but the reabsorption of tophi and articular thickenings. It markedly improved the high arterial tension which was not constant. The condenser couch had good effects in functional troubles connected with arterio-sclerosis—viz., diminution of the dyspnœa on exertion, headache, attacks of asthma or angina pectoris, local asphyxias of extremities. In applications of high tension the phenomena of resonance of the currents of high frequency were used. The applications might be general or local. The first were given by the bain de resonance. The subject was attached to one extremity of the resonator and was placed on an insulating table. The action was the same as in the static bath. Applications of effluve allowed to a certain extent the general effects of the bain de resonance. Locally, there appeared a redness of the skin and a marked diminution of the sensibility which lasted after the treatment. The effluve might be applied by glass electrodes. When the electrode in bad contact was moved over the skin it imparted a quantity of minute sparks which permitted a region to be rendered painless, to make it congested, and to determine in it a reaction the effects of which lasted long after the application. But the condensing electrode or the vacuum electrode of Macintyre well applied to the skin or to the mucous membranes allowed a quantity of effluve to pass which struck without injuring the point of application. With much tension and little quantity sparks approached those of the static machine. Generally they were repeated much more rapidly than the static spark. Moreover, even at very high tension they had almost always a quantity greater than the static spark with more marked production of heat. The high-frequency spark determined on the skin at the point struck and in its neighbourhood a spasmodic contraction of the vessels. It is from this that arose the fulguration conceived by Keating-Hart. In direct applications the results were antispasmodic and anticongestive. The most brilliant of them was the treatment of fissure of the anal sphincter discovered by Doumer, the success of which was incontestable. In hæmorrhoids the acute attacks in the course of chronic cases benefited fairly regularly and rapidly from the sedative and anti-congestive action. In the chronic forms the intra-rectal applications sufficiently prolonged, with periods of rest, produced beneficial action, prolonging the periods between the acute crises and ultimately causing their complete disappearance. The decongestive and revulsive action benefited local circulatory troubles, such as Reynaud's disease, commencing senile gangrene, atrophic sores, varicose ulcers, and a great number of skin affections.

BANQUET.

On Thursday evening members of the conference and their friends dined together at the Criterion Restaurant. Sir Humphry Rolleston, who received the guests and presided at the dinner, described the gathering as a family meeting of the Channel countries, arising out of a conference of smaller scope held at Antwerp in 1920. He felt that the conference was serving two notable ends—one, in making co-workers into friends, and, two, in demonstrating to physicians and surgeons the value of electrical methods. Sir StClair Thomson proposed the health of the guests in graceful French; Prof. Daels, of Ghent, responded in English and Prof. Bergonié, of Bordeaux, in French, both of them emphasising the work of electrologists in the service of science and humanity. Dr. Gunzberg, of Antwerp, in an amusing speech, desired to see physiotherapy made an obligatory subject in all medical faculties. The gathering was of a most friendly character, and an excellent bijou orchestra played during the reception and after the dinner.

A report of the Section of Physiotherapy will appear in THE LANCET next week.

MEDICAL FEATURES OF "AFRICA AND THE EAST" MISSIONARY EXHIBITION.

A Church Missionary Society Exhibition presenting scenes from Africa and the East has just been held at the Royal Agricultural Hall, Islington. The religious missionary in backward countries has always to care for the bodies as well as the souls of his flock, and most of those working in Africa and the East under the auspices of the Church Missionary Society are qualified medical men and women. At the exhibition were to be seen many features of medical interest. One of the objects of the exhibition was to show the manner in which hospitals are constructed and managed under tropical conditions, and it afforded a clear demonstration of the care of native patients from the nursing standpoint.

The Scope and Staffing of the Mission Hospitals.

The medical work of the Church Missionary Society dates from 1813, although the first permanent medical mission was not started until 1865, when a dispensary was opened in Kashmir. At the present time the Society has hospitals in East and West Africa, Egypt, the Sudan, Palestine, Persia, India, and China. There are 37 mission hospitals in all, five of which have medical schools attached, and there are leper establishments in connexion with four. Eight are fitted with

up-to-date X ray equipment, three have full laboratory and bacteriological facilities, and the majority have partial facilities for bacteriological research. These 37 hospitals have an aggregate of 4275 beds, while the nominal staff consists of 75 doctors and 85 nurses. Unfortunately only 59 medical men and 72 nurses are actually at work at the present time, the rest being on furlough or sick leave. Indeed, 17 of the 37 hospitals are in charge of one doctor working single-handed, and in these circumstances the work obviously cannot maintain a proper standard of efficiency. Five of the hospitals have no doctors and are in charge of nurses, whereas, on the other hand, three hospitals have one doctor and no trained nurses. Owing to insufficient staffing several hospitals have had to close during the past few years, and, as a matter of fact, all the mission medical schools are inadequately staffed. It is computed that at the present time 26 men doctors, 6 women doctors, 25 nurses, and 2 chemists are needed to be added to the staff to bring it up to the minimum of efficiency to cope with existing conditions.

The Medical Exhibits.

The medical mission exhibit consisted of a typical mission hospital, the building being divided by a wide corridor from which the various departments may be entered. A ward containing ten beds and a fully-equipped operating theatre was shown, with an X ray room fitted up by Messrs. Newton and Wright, and a laboratory with apparatus supplied by Messrs. Chas. Hearson and Co.; also a dispensary. Models of hospitals were also on view, notably of that at Mengo (Kampele) Uganda, the old Cairo hospital, a hospital in Pakhoi, China, and the mission hospital in Peshawar, India.

Diagrams, microscopic slides, pictures, and photographs were displayed illustrating bacilli and parasites responsible for the diseases most frequently met with in missionary lands, and another instructive section was that of the Medical Wants Court. This department of the Medical Mission Association assists in providing the hospitals abroad with articles essential to the efficient carrying on of the work. Specimens of bandages, splints, slings, &c., made by voluntary helpers were shown. In 1921–22 this department packed 150 cases for shipment.

In the Chinese Street the men's and women's hospitals and the Union Medical College were represented. The Foochow C.M.S. Medical Mission consists of men's and women's hospitals, where in-patients number well over 1400, and out-patient attendances more than 10,000 annually. There was also an exhibit illustrative of the medical mission work in the Fukien province. In one of the galleries the Nurses' Mission League had a stand. The League coöperates with all the societies doing missionary work, and acts as a sort of recruiting agency for nurses.

The Needs of the Medical Mission.

The exhibition reflected great credit upon those responsible for its arrangement and management. The medical missionary work done has been accomplished in the face of the greatest difficulties, and its record of work is impressive.

In 1921-22 42,863 in-patients have been admitted to the mission hospitals, over 900,000 out-patients have been attended to, and more than 30,000 operations have been performed. The important point to be observed in a review of the work done and being done by medical missionaries is the inadequacy of the medical and nursing staffs, dependent partly, at least, on the lack of sufficient funds.

The income of the Medical Missionary Auxiliary Fund, which is financed apart from the general Church Missionary Society Fund, was in 1921–22 £66,865, and the expenditure for the same period £67,069, leaving a deficit of £204. These missions are outposts of civilisation, as well as block-houses against epidemic disease. Further, they should provide almost unequalled opportunities for research work. Unfortunately men engaged in medical missionary work, however keen they may be to use their opportunities, are unable to do so because they are so greatly overworked. The exhibition will have served a useful purpose if it incites in young medical men and women and nurses a desire for missionary work, and in the wealthy members of the community a desire to enable them to perform it under more favourable conditions.

ROYAL INSTITUTE OF PUBLIC HEALTH: CONGRESS IN PLYMOUTH.

(*Concluded from p. 1163.*)

MEETINGS of the four sections of the Congress were continued on Friday, June 2nd, and Monday, the 5th, and included many interesting papers and discussions. On Friday morning a film, executed under the direction of Colonel L. W. Harrison, of the Venereal Disease Department of St. Thomas's Hospital, entitled "Gonorrhœa in the Male," was shown to medical members of the Congress at a local kinema establishment. The film, of which only two reels have yet been completed, is of great value for the teaching of students and general practitioners, and presents the pathology and course of the disease in a most graphic and even dramatic manner.

Birth Control.

Several important discussions took place during the Congress. In Section IV. a discussion on Birth Control was organised and aroused a great deal of interest. Lady Barrett opened the discussion and put the case for a limited practice of birth (or rather conception) control, but thought the medical attendant should in all cases be first consulted. She was not in favour of the public propaganda which had been going on recently, and thought that it was responsible for an idea which was prevalent at the present time that newly married couples should refrain from having children. She stated that there was evidence that some of the methods at present being advocated were definitely harmful to health.

Mrs. Scharlieb was unable to be present herself, but sent a short paper which was read. She opposed birth control unconditionally on the grounds that it was both harmful to health and would tend to destroy all self-control.

Dr. Lorimer Hawthorne spoke in favour of the dissemination of knowledge concerning birth control chiefly from the standpoint of the working-class mother whose fate it was so often to bear a far larger family than could possibly be decently brought up.

A good discussion followed, in which Dr. Killick Millard, Dr. H. Scurfield, Dr. Mervyn Crofton, Mrs. Neville Rolfe, Mrs. Cloudesley Brereton, and others took part. The general opinion of the meeting seemed to be in favour of birth control, provided that the newly married kept in view the ideal that it was their duty to society to bring up at least a small family.

Venereal Disease.

An important discussion on the Prevention of Venereal Diseases took place in Section I. on Monday morning, June 5th. Mr. Kenneth Walker, representing the N.C.C.V.D., and Mr. H. Wansey Bayly, representing the N.S.P.V.D., respectively stated the cases of their societies. In the discussion which followed the divergence of the views of the two societies upon essential matters was shown to be slight, and several speakers emphasised the importance of a rapprochement between them. Prof. E. W. Hope, M.O.H. of Liverpool, and others urged that public opinion was now ripe for legislative measures. The measures suggested were notification to the medical officer of health of discontinuance of treatment, and making it an illegal act knowingly to transmit a venereal disease. It was pointed out by Dr. G. D. Kettlewell, M.O. Venereal Diseases Centre, South Devon and East Cornwall Hospital, Plymouth, that clinics, in order to be successful, should be held at times convenient to the working man and woman, and that as

much of the club spirit as possible should be introduced into them.

Miss Norah March suggested that it would assist the work of the doctors in charge of the clinics if trained social workers of the nature of health visitors were employed to explain to patients the seriousness of these diseases, the danger of transmitting them, and the need for continuous treatment.

Social Functions.

On Friday evening, June 2nd, the Congress dinner was held at the Royal Hotel. Speeches were made by the chairman, Earl Fortescue, President of the Congress, the Bishop of Exeter, Sir William Smith, Mr. Winnicott, Mayor of Plymouth, Admiral Sir Montague Browning, Sir Thomas Oliver, and several foreign delegates.

On Friday afternoon and Saturday various excursions were made to Dartmoor, including Burrator Waterworks, the Royal Dockyards, Royal Victualling Yards, the river Tamar, and other places.

On Sunday morning, June 4th, the Mayor and Corporation of Plymouth, together with a good number of delegates, many of whom were in academic robes, walked in procession to attend divine service at St. Andrew's Church. The Bishop of Exeter preached the sermon, taking as his text "Be fruitful and multiply." He deplored the fall in the birth-rate, especially amongst the more highly educated members of society. He pointed out that if our national supremacy was to be maintained a numerous and virile population was required.

The Congress ended in as brilliant weather as it had begun and there was general agreement that it had been an unqualified success both socially and scientifically.

FEDERATION OF MEDICAL AND ALLIED SERVICES:

THE ANNUAL DINNER.

THE annual dinner of the Federation of Medical and Allied Services was held at the Café Royal, Regent-street, London, W., on June 7th, when a company of members and their guests representative of the various health interests of the country met under the presidency of Sir Berkeley Moynihan. Among those present were: Lord Islington (chairman, Citizens' Council of the Federation), Right Hon. Robert Munro, M.P. (Secretary for Scotland), Sir Arthur Robinson (Permanent Secretary, Ministry of Health), Sir Thomas Neill (chairman, Council on National Health Insurance, Ministry of Health), Sir Malcolm Morris (Vice-President of the Federation and chairman of its Medical Council), Lieut.-Colonel Nathan Raw, M.P. (chairman, Medical Committee in Parliament), Sir Alan Anderson (chairman, Organising Committee, London Hospitals' Combined Appeal), Sir Ronald Ross (representing the British Science Guild), Dr. E. Farquhar Buzzard (representing the Royal Society of Medicine), Sir Squire Sprigge (Editor of THE LANCET), Mr. Henry Lesser (hon. secretary, Citizens' Council and President, National Federation of Employees' Approved Societies), Mr. Philip Lockhart (Vice-President, Federation of British Industries), Sir J. Lynn-Thomas, Sir Robert Jones, Sir Thomas Horder (hon. treasurer of the Federation), Dr. Arthur Latham (vice-chairman, Medical Council), Dr. R. A. Gibbons, Dr. Dunbar Hooper, Dr. J. Blomfield, Dr. Morton MacKenzie (chairman, Organisation Committee, British Medical Association), Mr. A. E. Mortimer Woolf (Hunterian Society), Dr. R. H. Cole (representing the Medico-Psychological Association), Dr. Charles Buttar (joint hon. secretary of the Federation and representing the Harveian Society of London), Dr. Jane Walker (joint hon. secretary of the Federation), Dr. J. F. Gordon Dill (joint hon. treasurer and representing the Royal Society of Medicine), Prof. Frederick Hobday (representing National Veterinary and Medical Association), Dr. F. Hernaman-Johnson (representing the British Association of Radiology and Physiotherapy), Dr. H. Wansey Bayly (Society for the Prevention of Venereal Disease), Mr. Alfred E. Moore, Dr. Robert Milne, Dr. and Mrs. Pasmore, Miss Rundle (representing the College of Nursing), Miss Montgomery (representing the Association of Hospital Matrons, matron, Middlesex Hospital), Miss Innes (matron, Leeds General Infirmary), and Lieut.-Colonel N. Howard Mummery (medical director of the Federation).

The Duke of Bedford, Lord Glentanar, Colonel F. E. Fremantle, M.P., Captain Walter Elliot, M.P., Sir William Willcox, the Mayor of Exeter, Sir Arthur Stanley, and Dr. Charles Carpenter (vice-chairman of the Citizens' Council) were among those who wrote expressing their regrets at unavoidable absence.

After the toast of the King had been duly honoured, Sir BERKELEY MOYNIHAN proposed the health of Sir Alfred Mond, the Minister of Health, who unfortunately was prevented from attending the dinner, and coupled his name with that of the Right Hon. Robert Munro, M.P., Secretary for Scotland and President of the Scottish Board of Health. In a humorous but impressive speech, the President of the Federation said it was the privilege of the organisation over which he presided to sustain in every way the health of the Minister of Health by offering to him, when he might feel the need, such help as the Federation had the power to furnish. This power was, however, governed by two factors, union among the members of the medical profession, and the establishment of right relations with other bodies, and at the present moment, he said, medical men were not quite at peace among themselves, nor did we everywhere hear, as we ought, of wise tolerance of opinion, of views less tenaciously held and less bitterly expressed, and of every opportunity being taken for generosity of utterance. It was, he pointed out, quite natural that within the medical profession there should be deep and acute differences of opinion, for after all the everyday work of medical men was one of conflict, and in the fight with the enemy disease the doctor became an individualist, and the individualist had prejudices. But prejudice he would define as the emotional reaction of ignorance to truth and the sooner prejudice was got rid of the better for everyone. Although the work of the medical man was individual it had very obvious national and, therefore, political bearings. The profession should by degrees develop a corporate sense of its common ideals, duties, and responsibilities. Ideals could not be set too high—they were not for attainment but for pursuit. The more the Federation became widely representative the better for the medical profession and the better for the public, for the organisation was the nucleus of something of great national significance.

Mr. MUNRO, replying on behalf of Sir Alfred Mond, said that, speaking on the spur of the moment, he was forced to be brief and irrelevant. He felt perfectly sure that the Minister of Health would have expressed the wish to do everything possible to help the Federation, and, as far as he (the speaker) was concerned as President of the Scottish Board of Health, he would be glad to act in the same way.

Colonel NATHAN RAW, chairman of the Medical Committee in Parliament, in proposing the toast of the Federation, said that the work which it did was of high value and indeed urgent necessity. The objects were, first, to enable all those who were interested in health questions to meet in discussion so that bodies which had for their object the improvement of the national health could combine to form sound public opinion; secondly, to promote wise legislation on health matters and protect the community against unwise measures; and thirdly, to secure adequate representation in Parliament by those who were interested in great health problems. The first object, the forming of public opinion on questions of public health, was most important, and the aim of the Federation must be to see that publicity was given to its views through the press. In these days politicians and others concerned in public life were absolutely dependent on their views being properly recorded in the public press, and thus comprehended by the public. For that reason he welcomed the formation of the

Citizens' Council of the Federation, presided over by Lord Islington, whose name he coupled with the toast he was proposing. "We have in the Federation," said Colonel Raw, "first the Professional Council consisting of medical men with the necessary technical knowledge; then the Council of the Allied Services, representing the allied and ancillary bodies: and thirdly, the Citizens' Council, the object of which is to carry into effect through the public, acting for themselves, the reforms which the Federation might be able to advise." It was not, he would point out, the object of the Federation to attempt to send medical men to Parliament to represent their own profession, but rather to support suitable medical candidates who were interested in great health questions. The House of Commons, which, after all, was the last tribunal for questions of legislation affecting the public health, was always willing to listen to any medical man who could speak with authority or with special knowledge on questions concerning health.

Lord ISLINGTON, in responding, congratulated the Federation on the important progress which had been made during the three short years of its existence, and he hoped, as opportunity offered, to take a more active part in the affairs of the Federation, which should be of immeasurable importance and value in regard to the welfare of the nation. There had never been a time in the history of the country when such a union was so needed as now. The many health problems presenting themselves for solution required investigation by an enlightened and informed public, and for this purpose the Federation had already enrolled among its members men of eminence in medicine and surgery. Coöperating with them were the allied and ancillary societies and institutions which played a daily and an active part in the medical science of the country. Some 38 societies of this kind had now been enrolled representing 100,000 men and women belonging to those institutions. And in the machinery of the Federation there was also the Citizens' Council representing all the lay activities. A body of this representative character must, he considered, possess potential influence if only it conducted its business with singleness of mind and unity of purpose. Questions of health were no exception to the human rule that methods to attain a common end often present acute divergence of opinion and action. The Federation should afford an opportunity to meet and discuss conflicting points of view and reach common ground. This object would be secured if all concerned kept before their minds the main object of the Federation, which was to work for the welfare of the State by improving the health and opportunities of the community. Governments could do but little in this connexion unaided. Public opinion was an essential factor—in fact, public opinion was the community, and if the community was unorganised, inchoate, often misinformed, it presented an extremely dangerous instrument as a channel of reform. The community realised the evil—indeed, they were its first and chief victims, but they were ignorant of a remedy. They groped about in sections, unscientifically, uneconomically, to find one, and if the Government accepted their advice a set of new evils worse than the first too often arose. Public opinion clothed with the power of knowledge and organised on right lines, such as those which the Federation was laying down, could wield a great force, and he believed that such enlightened public opinion would be the salvation of the democratic system of to-day. The constitution of the Federation offered a neutral platform for discussion, and had a great future before it; for it should be of the greatest possible assistance to the Government, a most important informative agent of Parliament, and the finest educator of the public on health questions.

In proposing the health of the chairman, Sir THOMAS HORDER referred to the honour which had just been conferred on Sir Berkeley Moynihan and coupled with the toast the name of Sir Malcolm Morris to whom the Federation owed much for wise guidance, and whose golden wedding, he said, would shortly be celebrated.

Sir BERKELEY MOYNIHAN, having briefly responded, Sir HENRY MORRIS spoke under evident emotion at the memories of 50 years lived in harmony and unity with his wife "to whom I owe more than I can express." He said that one of his guiding principles throughout life had been that the knowledge of the medical profession should not be kept to the profession, but should be used for the good of the community as a whole, and that principle had inspired him in his work for the Federation.

During the evening Mr. Frederick Dawson, a friend of the President, entertained the guests with a charming selection of piano solos.

The Services.

ROYAL NAVY MEDICAL SERVICE.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lieut. W. H. Butcher, late R.N., is transferred to the permanent list, R.N.V.R.

ROYAL ARMY MEDICAL CORPS.

Maj.-Gen. Sir H. R. Whitehead, retired pay, is appointed Col. Commdt., vice Maj.-Gen. Sir T. J. Gallwey, retired pay.

Maj. and Bt. Lt.-Col. Wentworth F. Tyndale to be temp. Lt.-Col. whilst employed as Asst. Director of Hygiene.

Lt. (temp. Capt.) M. J. Whelton to be Capt.

The undermentioned Lt.-Cols. retire on retired pay: J. Cowan (on account of ill-health) and T. C. Lauder.

Lt.-Col. H. E. Staddon is placed on the half-pay list on account of ill-health.

Capt. J. L. Ritchie retires, receiving a gratuity and is granted the rank of Maj.

Temp. Capt. S. McNair relinquishes his commn. and retains the rank of Capt.

ARMY DENTAL CORPS.

Temp. Capt. A. Gibson, Dental Surg., from Gen. List, to be Capt.

MILITIA.

Capt. W. G. Burns relinquishes his commn. and retains the rank of Capt.

TERRITORIAL ARMY.

Capts. (Bt. Maj.) D. W. Boswell and W. J. Harrison to be Majs.

Capt. J. S. Cooper, from T.F. Res., to be Capt.

Col. R. Pickard vacates the appt. of A.D.M.S., 43rd (Wessex) Divn., T.A., resigns his commn., and retains the rank of Col., with permission to wear the prescribed uniform.

The undermentioned, having attained the age limit, are retired and retain their rank, except where otherwise stated: Lt.-Cols. R. R. Sleman (granted the rank of Col.), W. L. Bentley, G. B. Masson, and S. Nesfield. Majs. J. Bruce (granted the rank of Lt.-Col.), W. Patterson and W. D. Watson (granted the rank of Lt.-Col.). Capts. W. H. E. Brand, H. J. Brownrigg, R. T. Bruce, M. A. Cholmeley, R. A. Freeman, E. K. Goodwin, S. D. Graham, F. S. Jackson, A. Maude, H. T. N. Merrick, A. W. Paterson (granted the rank of Maj.), J. A. Stephen, J. Tait (granted the rank of Lt.-Col.), H. England, F. Jeeves, W. W. Maxwell, L. Rawes (granted the rank of Maj.), F. Ward (granted the rank of Maj.), and T. Aspinall (retains the rank of Capt.).

Lt.-Cols. A. K. Chalmers, J. J. O'Hagan, T. Holt, T. Stevenson, and J. R. Whait; Majs. A. Elliot (granted the rank of Lt.-Col.), E. B. Waggett, and J. Wood (granted the rank of Lt.-Col.); Capts. E. L. Forward (granted the rank of Maj.), W. Clegg-Newton, L. S. Gaskell, and T. S. Worboys.

General Hospitals: Maj. D. Dougal (late R.A.M.C. Spec. Res.) and Capt. W. H. P. Hey to be Majs.

ROYAL AIR FORCE.

J. Prendergast is granted a short service commn. as a Flying Officer (Hon. Flt. Lt.); E. Huntley is granted a temp. commn. as a Squadron Leader; and Capt. W. E. Hodgins, R.A.M.C., is granted a temp. commn as a Flt. Lt. on seconding for three years' duty with the R.A.F.

Lord Charnwood has accepted the presidency of the National College of Teachers of the Deaf in succession to Lord Sheffield.

THE King has given to Dr. Sydney Alfred Smith, Principal Medico-Legal Expert, Egyptian Ministry of Justice, licence and authority to wear the Insignia of Officer of the Order of the Nile, which has been conferred upon him by the King of Egypt in recognition of valuable services rendered by him.

Correspondence.

"Audi alteram partem."

PROTEIN-BALANCE IN INFANT FEEDING.

To the Editor of THE LANCET.

SIR,—In Dr. Eric Pritchard's lecture on artificial feeding which appeared in your issue of April 29th, he says that—

"No matter how accurately a diet may comply with the calorie requirements, nevertheless if the balance or ratio between the three main constituents—i.e., the protein, fats, and carbohydrates—is not reasonably correct, in the long run the infant's nutrition will be bad."

Later on he says:—

"Of the many anomalies which surprise and puzzle critics of our national methods of artificial feeding there is none so amazing and inexplicable as the practice of altering the balance of artificial substitutes for breast milk as the infant grows older."

In answer to Dr. Pritchard I should like to quote Dr. Emmet Holt's opinion on this point as it agrees with my own experience in a large number of cases where cow's milk has to be substituted for human. In an article[1] on food requirements of infants, he says:

"The protein intake of the normal nursing infant is very low. It ranges during the first nine months of life appreciably from 8·0–12·0 g. daily. This is equivalent to only about 1·5 g. per kilo. Up to nine months the proteins taken by nursing infants seldom exceed 12 g. daily. This amount must be sufficient to supply not only maintenance need but the need for growth during the most active period of growth in the life of the child, for we find our best examples of good nutrition and growth in breast-fed infants. The reason for the adequacy of this small protein intake is that the protein of woman's milk is certainly best adapted in its amino-acid composition for digestion and assimilation by the infant. When cow's is substituted for woman's milk experience has shown that the protein intake must be considerably increased, doubled, or trebled. Infants 1–9 months of age receive from 15–30 g. of protein daily when fed on the usual modification of cow's milk. This represents fully 3·8 g. and often 4·0 g. of protein per kilo. The increase of protein requirement when cow's is substituted for woman's milk is probably due to the difference between the two milks in the amino-acid content. Woman's milk contains about twice as much lactalbumin as cow's."

In another part of the same article Holt says:

"In the early days of milk modification by the percentage method, it was thought that cow's milk mixtures in which the proportions of fat, sugar, and protein were as nearly as possible those found in woman's milk would be the best substitute for it. The many failures from the use of such formulas have been attributed to the too high fat, but it now seems quite evident that the low protein was even more at fault. It has become increasingly clear with clinical experience that the majority of infants will not thrive normally on cow's milk unless they are given two or three times as much protein as is contained in woman's milk."

I cannot help feeling that Holt's explanation is the right one and that Dr. Pritchard makes a mistake in not differentiating sufficiently between the human and cow proteins. I maintain that a considerable number of infants do not thrive on Dr. Pritchard's formula because they do not absorb a sufficient amount of protein for their adequate nutrition. The results of increasing the protein are often quite remarkable. The increase must, of course, be made very gradually for fear of producing dyspepsia, but apart from dyspepsia, I know of no bad symptoms which can be attributed to excess of protein.

I am, Sir, yours faithfully,

Kensington, June 2nd, 1922. RONALD CARTER.

GONOCOCCAL MENINGITIS.

To the Editor of THE LANCET.

SIR,—I have taken great interest in the annotation on gonorrhœal meningitis in THE LANCET of April 15th, as it has been my privilege to see and investigate such a case. The case which occurred in Staffordshire when I was doing cerebro-spinal fever work in the Army, was briefly as follows:—

I was called to see a man suffering from the physical signs and symptoms of acute meningitis. The patient was under treatment for acute gonorrhœa at the time, and the onset of meningeal symptoms was sudden and typical. I saw him within 24 hours of the onset, and performed lumbar puncture, taking off 35 c.cm. of very purulent cerebro-spinal fluid, and giving intrathecally 30 c.cm. polyvalent anti-meningococcal serum, until a confirmation of the diagnosis was reached by laboratory methods. On examination of films prepared directly from the fluid an intracellular Gram-negative diplococcus was found, which did not look like meningococcus, but was very suggestive of gonococcus. The fact that the man was under treatment for gonorrhœa suggested to me the possibility of this being a case of acute gonococcal meningitis, and cultural confirmation was carried out. Cultures were made on trypsin legumen agar, and on blood-smeared agar plates, and there was no growth after 24 hours; but after three days colonies of gonococcus appeared, the greater growth being on blood-smeared agar. To further prove that these were gonococcal colonies they were tested against the type serum, and type cocci of the meningococcal group for agglutination with negative result. They were also tested for fermentation with glucose and maltose, and it was found that the glucose alone was fermented, thus further establishing their identity.

The patient died within 24 hours of lumbar puncture, and no post-mortem was done, but I think the cultural proofs sufficient to warrant the diagnosis of acute gonococcal meningitis. Without such proofs I do not consider such a diagnosis can be made, as the meningococcus can cause an acute secondary infection in the male genital organs, as proved by orchitis, and epididymitis occurring as complications of cerebro-spinal fever. To rely simply on the finding of a Gram-negative intracellular diplococcus in the cerebro-spinal fluid, and a similar organism in the seminal vesicles, without even a urethral discharge, does not seem to me to be conclusive. The organism in such a case might quite well be the meningococcus, as in my own experience I have isolated this organism from the cerebro-spinal fluid, sputum and rash in the same case, and I think it is not beyond the limits of possibility to isolate the organism from the seminal vesicles where the meninges are primarily affected, and especially if there was a complication present such as orchitis or epididymitis.

I am, Sir, yours faithfully,

DAVID SMITH, M.D., F.R.F.P.S.(Glasg.),
Dispensary Physician, Glasgow Royal Infirmary.

June 1st, 1922.

WHY IS SEPTIC AURAL DISCHARGE SO COMMON?

To the Editor of THE LANCET.

SIR,—Whilst engaged on work in a clinic for school children for defects of the ear, throat, and nose I was struck with a few points which may be of interest in the present discussion in your journal.

A number of children of the early age of 7 to 10 years were referred to me by the school medical officer for marked deafness, in most cases without an associated otorrhœa and in the smaller number with the discharge beginning from the age of 2 or 3; on examination it was astonishing to find an advanced condition of catarrhal otitis media with the usual thickened and retracted drumhead which had been insidiously creeping on for years. In a large number of those with otorrhœa there was no history of any of the exanthemata, but merely following upon an ordinary cold, and regarded lightly at the time, and the parents were told that the condition would clear up by syringing, &c. In nearly all these cases there was definite evidence of chronic post-nasal catarrh associated with adenoids. But in many of the cases there was an absence of any marked hypertrophy of the adenoid mass and definite chronic hypertrophic rhinitis (with or without septal deformity), and, of course, hypertrophy of the turbinates, especially the middle. Also in cases of otorrhœa and of deafness children were listed for operation (before

[1] American Journal of Diseases of Children, vol. xxii., No. 4, October, 1921. L. Emmet Holt and Helen Forbes, New York.

the aural clinic was established) for adenoids where none existed, and the catarrhal or septic lesion was kept active by chronic nasal catarrh from the causes mentioned above.

The routine was therefore established that all children were seen by the school medical officer, referred to the aural clinic, and from there sent to the proper departments for the respective treatment—i.e., for adenoids, for cauterisation, turbinectomy, or septal resection, as the case required. Before return to school the children were always seen by the aurist and kept under his supervision by the S.M.O. for the necessary after-treatment. It struck me forcibly that the inspection of school children for adenoids and for ear conditions generally, and for otorrhœa especially, should be undertaken at an earlier age in the infants' class, before irrevocable damage was done, which only came to the notice of the aural surgeon when the infant had passed into the age for routine inspection. A few early cases came from the maternity and child welfare clinic, but these were a very small proportion of the whole of the small sufferers.

I need not dwell on the type of treatment, as this has been discussed already, except that I found the collosol preparations of great value in the earlier cases; and a point, not noted so far in the discussion, is the rapidity and ease with which the early cases of otorrhœa (after the acute stage was over) cleared up with daily ionisation with zinc or with iodine, this treatment being only of use in the older patient who is manageable.

The incidence of otorrhœa in this town is undoubtedly partly due to a prevailing south-westerly wind and, which is of more importance, to the daily irritation of the nasal and post-nasal mucous membranes by the almost constant presence of coal-dust. It is quite impossible for the school medical officer adequately to cope with all the ear cases and the conditions leading up to their causation. He is, as a rule, sufficiently burdened with a whole host of inspections and reports and clinics to be able to give any time for anything but a cursory examination of these cases, even though he may have the knowledge and the penchant for such work; and the pay of these officers does not tend to make a special study of such work worth the while.

There can be no doubt that the appointment of a whole-time aurist, or, at least, a part-time officer with adequate remuneration for efficient services, would repay any town that has the welfare of its citizens at heart, since a deaf person is extremely limited in his choice of work and appointment to a job in these competitive days alongside his more fortunate brethren who do not carry the cotton-wool emblem of the chronic septic aural discharge.

I am, Sir, yours faithfully,

R. ECCLES SMITH, O.B.E., F.R.C.S.

Barry, Glam., June 9th, 1922.

YARROW CONVALESCENT HOME, BROADSTAIRS.

To the Editor of THE LANCET.

SIR,—The special feature of the Yarrow Convalescent Home at Broadstairs is not sufficiently known. It is intended for the children of the educated class of limited means, and it is common knowledge that there are an exceptional number at the present time of such families, their financial difficulties having been brought about as the result of the war and the high cost of living. Facing the sea there are extensive balconies upon which the children lie out and get the benefit of the fresh air. There are also extensive playing grounds. There is a dairy attached to the Home, from which only Grade A milk is obtained, and there is practically no limit to the amount of milk which the children are allowed to take. All the cows are periodically tested against tubercle.

No letters or introductions are necessary: all that is needed to gain admission is, that the children are recovering from operations or illnesses, and require a helping hand in the shape of good food and fresh air to secure final recovery. The charge of 10*s.* a week is made as it is the desire of the Committee of Management that the parents should contribute to the cost of their children's recovery. The fees, however, are somewhat elastic, and those who can afford to pay more than 10*s.* are expected to do so.

With regard to the length of stay at the Home, there is no limit; it is determined by Dr. Moon, and if he considers a lengthened stay is necessary to put the children in a good state of health, it is not curtailed. It is the desire of the Management, instead of temporarily benefiting large numbers of children, permanently to put a reduced number in the best of health.

The Management prefers to be dependent on the medical profession for recommending suitable cases, but it must be clearly understood that in no case will a child be admitted when there is any suspicion of an intention to use the Home as a holiday resort. The Home has been established solely to help the children of the educated class so to recover their health as to fit them for life's battle.

I am, Sir, yours faithfully,

June 12th, 1922. ETHEL DAWSON OF PENN.

PULMONARY BASAL PHYSICAL SIGNS IN RHEUMATIC PERICARDITIS.

To the Editor of THE LANCET.

SIR,—Once more I venture to trespass upon your valuable space in connexion with pathological conditions relating to the heart. Dr. Robert Hutchison, in his paper in your issue of June 3rd upon Acute Carditis in Childhood, refers to Bamberger's sign and seems inclined to attribute it to "pneumonic subacute consolidation." From that opinion my own post-mortem and clinical experience would lead me to differ. For example, I was in a ward on one occasion when a physician, after examining a case of acute rheumatic pericarditis in a child, stated that he noted the presence of pneumonia of the lower lobe of the left lung. Cases seen after death led me to suggest that the presence of bronchial breathing heard near the inferior angle of the scapula had misled the physician regarding the presence of pneumonia. On the following day we were able to prove in the post-mortem room that such had been the case. No trace of any consolidation of the lung was present.

While I agree that a "pneumonic subacute consolidation" occasionally occurs in cases of rheumatic pericarditis, or that a triangular strip of collapse of the lower lobe may sometimes be present on the left side, and also occasionally on the right, it does not seem to me that these conditions account for the bronchial breathing which may be heard near the inferior angle of the scapula in cases where an enlarged heart is consequent upon the presence of rheumatic pericarditis. The sum of my post-mortem experience relating to bronchial breathing near the inferior angle of the scapula led me to the following conclusion. Any abnormal condition within the chest which aids the conduction of tracheal sounds, yet the abnormal condition does not reach the chest wall, may lead to the tracheal sounds—i.e., bronchial breathing—being heard near the inferior angle of the scapula. For example, in a case of pneumonia of the posterior half of the left upper lobe, in which the consolidation did not reach the axilla, bronchial breathing was heard only near the inferior angle of the scapula. Bronchial breathing, as is well known, may be heard in this area in cases of dilatation of the bronchial tubes, and a cavity has more than once been wrongly diagnosed at this spot in consequence. The enlarged heart pressing upwards against the bifurcation of the trachea acts like the patch of pneumonia or the dilated bronchial tubes as a conductor of the tracheal sounds. But, it may be asked, why should the bronchial breathing be best heard over an area near

the inferior angle of the scapula? My suggested explanation may appear to be fanciful. It is that in the closed cavity of one half of the chest the tracheal sounds radiating from near the centre are everywhere reflected from the inner surface of the chest wall, and the chief point of convection of these reflected sounds is near the inferior angle of the scapula. Whether or not this is the explanation, there is not the least doubt that marked bronchial breathing may be heard over an area near the inferior angle of the scapula in cases of rheumatic pericarditis with enlarged heart in which there is no consolidation of any kind in the lung.

It is with diffidence that one refers to one's own observations, but Dr. Robert Hutchison does not mention me in association with those who have pointed out the influence of rheumatism on the cardiac muscle. In a paper in THE LANCET in 1896 entitled Is Mitral Regurgitation from Valvular Disease Common or Serious? I suggested that the importance attached to murmurs and to valvular disease was largely mistaken. Following that I wrote several papers dealing with the effects of rheumatism upon the heart. In THE LANCET, 1902, vol. ii., p. 1594, I pointed out that myocarditis may be present in rheumatism without the presence also of pericarditis, that fatal dilatation of the heart following rheumatism may occur in the absence of valvular disease, and that hypertrophy as a result of rheumatism may occur also without valvular disease. It was also indicated that "functional" disturbances such as tachycardia and cardiac pain may follow rheumatism. It may be added that at the annual meeting of the British Medical Association held at Swansea in 1902 I showed a microscopical section of the cardiac muscle from a case of chorea in which death had occurred from broncho-pneumonia. The section showed that in chorea—as in rheumatism—disease of the cardiac muscle may be present although pericarditis is absent.

I am, Sir, yours faithfully,

June 10th, 1922. THEODORE FISHER.

A PLEA FOR A STANDARD TEXT-BOOK OF SURGERY FOR EXAMINATION PURPOSES.

To the Editor of THE LANCET.

SIR,—Mr. C. A. Pannett in his letter in THE LANCET of June 3rd seems to think that a standard text-book of surgery, produced in the way I suggested, might be considered to contain the only true account of surgical knowledge because it was the production of a committee of experienced surgeons, and that it might be thought that all views contrary to those expressed in this book were erroneous, and all information not contained therein valueless. I do not think really such an unreasonable view of it would be held. Clearly its statements would have more authority than those of any one text-book because they would be the carefully considered views of the majority of a committee of surgeons, but obviously they might be wrong, and a few years later might admit this by very extensive alterations in a new edition. Mr. Pannett very truly points out that the discrepancy now existing amongst the various text-books is, in some instances, due to the process of the evolution of surgical knowledge, and what one text-book says to-day others may say later on. But what is the student to say at his examination? He cannot be expected to know the divergent views of different surgeons, nor have studied the evolution of surgical knowledge. He may derive much interest, and even some little amusement, from the diversity of views held by his teachers, but that will not help him at his examination, when he has carefully studied his own particular text-book and thinks that he really knows it fairly well, he may feel very hopeful as to the examination result (provided he has done good practical work also), but when he finds that the more text-books he consults, the less confident he becomes as to his knowledge, surely there is something gravely wrong, and the student is justified in asking, what he is really to believe?

It is not with regard to matters under discussion amongst surgeons, such as the indications for operation in Graves's disease, or the advantage of resection of a portion of the stomach for gastric ulcer, that the difficulty arises, as most examiners would recognise that these were matters about which there was a difference of opinion, but the trouble is that there are many statements in the various text-books which the examiners do not know are there, and if given by a student at his examination might be considered by them as erroneous. It is only by reference to a given subject in several text-books that these conflicting statements are discovered, and the fact that two examiners almost always work together does not prevent a student losing marks for a statement which he is quite justified in making from the information given in the particular text-book which he has studied, for very likely neither examiner may know such a statement is made in any text-book. No doubt if they did know the candidate would not lose marks, but this really raises a very important question: Should an examiner accept any answer because it happens to be the teaching of one of the many text-books of surgery? If there were a standard text-book, such as I propose, the question could not arise.

Mr. Pannett points out that a candidate's chances at the examination would not be imperilled because he gave what the examiner considered an erroneous view as to why the inner table of the skull fractures more extensively than the outer. Certainly he would not, even if he made one really serious mistake, but by making statements which the study of his particular text-book would justify, but were not acceptable to the examiner, he would lose marks which might reduce his total below the pass level.

I quite admit that the production of the standard text-book by a committee of surgeons would not be an easy task, but I maintain it would be well worth the trouble. I do not see that the actual writer need feel aggrieved by the criticism of his colleagues. It would not be his text-book, he would be only one of a committee, and his special work would be only the basis for general discussion. Mr. Pannett thinks the standard text-book would not be in the interests of surgery, or to the advantage of the future practitioner, or the benefit of the community, and would stifle inquiry. The only way in which I can conceive of its not being in the interests of surgery, or detrimental to the interests of the community, would be by stifling inquiry, but surely there is no reason to think it would do this. It would have to be most thoroughly revised, in the light of new surgical knowledge, from time to time. If a surgeon's views were not represented in the standard text-book it is obvious that their omission would be no indication that they were erroneous, and they might very likely be adopted in the next edition. And such a book would clearly be of much greater value to the "future practitioner" than any ordinary text-book, for it would give him much more authoritative statement, but he would not for a moment imagine it represented the whole of surgical truth, but he would recognise it was the carefully considered opinion of the majority of a body of very competent surgeons and nothing more. The diversity of views with regard to surgical matters must be inevitable, and is undoubtedly stimulating, though perhaps more to the surgeon than the student. But it is not fair to the student that amidst all the diversity of statement and opinion he cannot find one clear account of what he knows will be acceptable at his examination.

Does Mr. A. Miles seriously maintain that the greater part of the student's knowledge is derived from his personal observations of disease and injury and not from what he has read in his text-book, or has been told in class, or lecture, or at the bedside by his teacher? From all such sources of knowledge he may receive the most divergent statements, and it matters not whether it be from his text-book or his lectures, or at the bedside of

the patient. Surely he should have at least one source of information, authoritative for examination purposes, that he can rely on. It is curious to find Mr. Miles—a joint author of one of the most popular text-books of surgery—disparaging the text-book in surgical education. It certainly seems to me a very important part of it, especially such a text-book as Mr. Miles is the joint author of. Of course, clinical work is of the utmost importance to the student, but what student would be so foolish as to present himself for examination without a careful study of his text-book also? It is profoundly true that the student should not seek knowledge merely for examination purposes, but all the same he naturally has to bear in mind that his examination must be passed, and what I now plead for is that he should have a reliable guide, as to what will be acceptable there, seeing that there is so much divergence of opinion amongst his teachers.

Mr. Miles seems to consider it unreasonable to expect a student to give the statements of a standard text-book if he believes them to be incorrect, or for an examiner to have to accept such statements from a student if he considers them wrong. But the student could always say on what authority he made statements contrary to those of the standard text-book, and so long as he knew what was the statement of the standard text-book that would be sufficient; and I can see no difficulty in an examiner receiving the statements of a standard text-book from a candidate, even though it might not represent his own view. Mr. Miles says the examiner should know the conflicting views held on surgical matters, and be ready to accept any one of these views from a candidate, but as I have pointed out elsewhere in this letter, the difficulty does not arise with regard to such controversial matters, but in connexion with those about which the examiners do not realise how divergent are the views in the various text-books. I need only add with regard to Mr. Miles's letter that the 1921 edition of his text-book has, so far as I know, only been quite recently published, and it is the 1915 edition which is now being very widely read by students.

Mr. J. Hutchinson thinks I suggest the production of an "infallible" text-book. It will be obvious from the earlier part of this letter that such an idea was very far from my mind. Undoubtedly there would be considerable difference of opinion among the members of the editorial committee, as Mr. Hutchinson points out, and the final form of many of the statements in the standard text-book would have to be determined by a majority of votes. If there is one thing this correspondence more emphasises than any other it is the wide and frequent divergence of surgical opinion. Why should the student suffer because of this in his examination? The only fair thing to do for him, it seems to me, is to produce a text-book, the statements of which he knows will be acceptable at his examination. Mr. Hutchinson fears this would render the examination less practical. But how would it do this? I fail to see that it would have any effect on the practical part of the examination. To provide the student with a standard text-book could not make him rely more on it than on any other text-book to the exclusion of practical work. As I have already pointed out, no student can rely entirely on practical work, valuable though it is, he must study some text-book; then let it be one, on statements in which he can rely, as acceptable at his examination.

I am much tempted to enter into a discussion on the nature of myeloma, but interesting though it would be (and I may say my own views coincide with Mr. Hutchinson's) it is really beside the point of my plea. It is the marked divergence of statement to which I call attention, and it matters not to the student from the examination point of view which is really the correct one, but the important matter to him is which will be acceptable at his examination. I do not for a moment mean to imply that this is all that really interests the student, for I know it is not, and I am quite sure he is usually very keen on information and anxious to discover the exact truth, quite apart from examination work, but we cannot blind ourselves to the fact that the passing of their examination must be a real and constant anxiety to many.

I am, Sir, yours faithfully,

Bristol, June 11th, 1922. CHARLES A. MORTON.

PERNICIOUS ANÆMIA AND ACHLORHYDRIA.

To the Editor of THE LANCET.

SIR,—Dr. T. Izod Bennett and Mr. E. C. Dodds deserve congratulation for the latest of their admirable series of contributions to our knowledge of the secretory disorders of digestion, which appeared in your issue of June 10th. For the following reasons, however, I feel sure that they draw an erroneous conclusion from their observations, when they suggest that the achlorhydria of pernicious anæmia is secondary to the anæmia.

1. There is abundant evidence that the achlorhydria precedes the development of the anæmia. As Robert Hutchison first pointed out in 1909, there is generally a more or less long history of digestive disturbances of the type commonly associated with achlorhydria preceding the first symptoms of anæmia. In one case achlorhydria was actually discovered three years and in another 12 years before the onset of anæmia.

2. In 164 out of 166 test-meals carried out at Guy's and the London hospitals on cases of pernicious anæmia achlorhydria was complete. At whatever stage in the development of the anæmia the examination is made there is achlorhydria. It was present, for example, in cases in which the hæmoglobin percentage had not fallen below 85, 85, and 68; it is thus a far more constant symptom than any other, even than the hæmatological signs, such as a high colour-index and the presence of macroblasts, as these are often absent in the early stages and even temporarily when the anæmia is severe.

3. It persists when the anæmia has disappeared, either spontaneously or as a result of treatment. Thus in four cases it was still present when the hæmoglobin percentage was 85, 82, 80, and 70 respectively, compared with 45, 38, 23, and 53 respectively some months or years before.

4. I cannot agree with Dr. Charles Miller that gastric secretion is always notably diminished and is often absent in patients with ulcer who have recently had a serious hæmorrhage. Fractional test-meals in the last four cases of the kind I have seen gave curves of exactly the form which would have been expected, apart from any hæmorrhage, although the percentage of hæmoglobin in these cases was 30, 33, 48, and 49, which is quite as low as one would expect to find in an average series of cases of pernicious anæmia when first examined. Achlorhydria may, of course, be found occasionally with a chronic gastric ulcer whether there has been a hæmorrhage or not. In two cases of secondary anæmia caused by rectal hæmorrhage with a hæmoglobin percentage of 44 and 42 respectively, and in two cases of chlorosis with a percentage of 25 and 48 the curves of gastric secretion were normal. It is clear, therefore, that anæmia does not cause achlorhydria.

5. Complete achlorhydria only occurred in 30 per cent. of our series of cases of cancer of the stomach; it bore no relation to the severity of the associated anæmia or the part of the stomach in which the growth was situated.

6. In a long series of cases it becomes clear that the achlorhydria is not a specific one, but that whatever its origin may be it predisposes to the development of pernicious anæmia. Thus in many cases the history points to its being congenital or "physiological." In one it was due to alcoholic gastritis, in another it resulted from a gastro-enterostomy performed for ulcer, and—what proves conclusively that it is primary and not secondary—in at least four cases pernicious anæmia followed the artificial achylia produced by

total gastrectomy performed for cancer. There is thus no constant pathological change, such as atrophy, in the gastric mucous membrane after death, and in one case of pernicious anæmia, in which a fragment was excised during an operation for appendicitis, Dr. R. D. Passey found no atrophy and no more inflammation than in a specimen obtained under similar conditions in a case of "benign" achlorhydria.

For the above reasons I believe that pernicious anæmia is caused by poisons absorbed from the intestine, where they have been produced by the action of bacteria coming originally from the mouth, the presence of achlorhydria having deprived the stomach of its antiseptic powers, which normally exert a powerful influence in protecting the bowel from such infection.

I am, Sir, yours faithfully,

ARTHUR F. HURST.

New Lodge Clinic, Windsor Forest, June 12th, 1922.

Obituary.

GORDON LEY, F.R.C.S. ENG., M.R.C.P. LOND.

Gordon Ley, whose tragic sudden death in an aeroplane accident we recorded last week, was the son of Mr. Richard Ley of Exmouth, and was born in Exeter on June 19th, 1885. He was educated at Malvern and at the London Hospital, qualifying M.R.C.S., L.R.C.P. in 1908, and becoming F.R.C.S. in 1912 and M.R.C.P. in 1913. His early interest in obstetrics is shown by the fact that in 1907 he won the obstetric scholarship and prize at the London Hospital. Gordon Ley's first resident appointment was that of house surgeon at the Gloucester Royal Infirmary in 1910; from there he proceeded to Queen Charlotte's Hospital, where he held in succession the posts of junior and senior resident medical officer over a period of eight months. It was this appointment which determined Ley's choice of a career. Obstetrics inspired him with enthusiasm and his natural abilities soon became apparent. In 1913 he was appointed pathologist to the Chelsea Hospital for Women, holding this post till 1921, and in March, 1914, obstetrical registrar and tutor to Charing Cross Hospital, which appointment he held almost up to the time of his death.

Gordon Ley suffered from congenital valvular disease of the heart, and his physique was so low that he was totally rejected for military service during the war. Few men, however, worked harder than he did at home. He voluntarily acted as resident medical officer to the City of London Maternity Hospital throughout the war, and from the beginning of 1917 onwards, owing to the absence on military service of his senior colleague, he did almost the entire work of this hospital. In addition he volunteered his assistance at the London Hospital, which had been deprived of the services of two of the gynæcological staff by the exigencies of the war, and had charge of beds there, besides taking over the duties of obstetrical registrar and tutor for a great part of the war period, and also acted as pathological assistant. Further, he took charge of the Jewish Maternity Home, Underwood-street, as consulting physician, and he was on the rota of the Lady Howard de Walden Maternity Home for officers' wives. Throughout the war he lectured twice a week at the Midwives' Institute, and continued this work up to the time of his death. In 1918 he was appointed gynæcologist to the Hampstead General Hospital, and in 1919 assistant obstetric surgeon to the City of London Maternity Hospital, both of which appointments he held up to the time of his death.

In addition to this record of hospital work Gordon Ley found time for original research, and he has left us a short series of admirable papers on clinical and pathological problems connected with obstetrics. His first considerable effort was the collation of 100 cases of full-term extra-uterine pregnancy from the literature, with two original cases upon which he had operated himself. Two years later he published an able communication on accidental hæmorrhage, advancing cogent reasons for regarding this condition as toxæmic, and from the results of microscopic examination of the uteri removed for this condition, he was able to offer an explanation of the mechanism of production of the bleeding. This paper should form the starting point for future work on the subject. Another subject to which Ley devoted much attention was carcinoma of the ovary. The preliminary results at which he arrived were communicated to the Section of Obstetrics and Gynæcology of the Royal Society of Medicine in 1919. Since then he had continued his work, and had undertaken to open a discussion on Primary Carcinoma of the Ovary at the forthcoming meeting of the British Medical Association at Glasgow. This work is unfortunately not sufficiently advanced to allow of its being published as a posthumous paper. Short articles Ley also contributed to various medical journals and volumes of joint authorship.

Mr. T. Watts Eden writes: "Gordon Ley was a man of outstanding personality, with a quick, receptive intelligence, and a remarkably retentive memory. He thought independently and strongly about any subject in which he was interested. He was endowed with a cheerful and confident disposition, and was optimistic perhaps to the verge of recklessness. Although hampered by a frail physique, he was a tireless and enthusiastic worker, and loved work. Like most men of his mental calibre he did not suffer fools gladly, and accordingly not all men were found to speak well of him. There can, however, be no doubt that he was one of the ablest men of his standing in the whole country. That he could have done work of conspicuous merit, or even of historic importance, had he lived, and had his health been maintained, there can be little doubt. Those who knew him well will regret his untimely departure, not only for his unfinished work, but for the loss of his example as a devoted worker and a loyal friend."

"A. S. M." writes: "Gordon Ley's tragic death marks one more instance of the untimely cutting off of a life valuable to medicine. Skilled in his profession, a brilliant and swift operator, he yet found time to engage in research in obstetrics and, under the auspices of the Medical Research Council, had begun investigation in a field which has been much neglected hitherto. He rejoiced in friendship and high ideals. Under an amiable cynicism he hid a kind and sympathetic nature that spent itself freely and without thought of return in the service of others. Women, especially, who in hours of crisis and suffering have found help in his encouraging presence, his words of advice and counsel, and the skill of his hands, must mourn to-day not only the loss of their physician, but also that of an understanding friend. Off duty he was a charming playfellow. Children knew and appreciated his rare sympathy and he was ever at home with them. His artistic bent found expression in collecting old china, in the reading of poetry, and the making of verse. The spirit of adventure surged high in him: hence his delight in aviation; but he also loved the sea and to be out in a small sailing boat in the roughest of weather. Surely, it was fitting that in death the waves of England's sea received him."

FREDERICK TURTLE, M.D. ST. AND.

A VETERAN has passed away in the person of Dr. Frederick Turtle, of Woodford. Born in 1833 at Newcastle-under-Lyme, he was apprenticed, as was the custom in those days, to Dr. Tom Foster, of Manchester, before entering upon his medical curriculum, which at that time consisted of three winter and two summer sessions, at the Middlesex Hospital. He obtained his first qualification, M.R.C.S. Eng., in 1855, and the L.S.A. a year later, and he then held the posts of house surgeon at the Royal Free Hospital, and resident medical officer to the Marylebone Infirmary at a time when the clinical

thermometer and the stethoscope were not in general use. At the former institution he was associated with the late Mr. Thomas Henry Wakley, F.R.C.S., who edited THE LANCET in succession to his father, the Founder. He graduated M.D. St. And. in 1862.

After a short time in practice at Lamberhurst and Collett-place, London, E., Dr. Turtle succeeded the late Dr. Duchesne at Woodford in 1866, where he continued in active practice until 1902, a period of 36 years. Sympathetic in disposition, energetic, and gifted with an extraordinary natural memory, he conducted successfully a very large practice, at the same time keeping up with current events in medicine. He retired 20 years ago, but retained his health and energy until a few weeks ago, still finding interest in new medical discoveries, and he could occasionally be found reading in the library of the Royal College of Surgeons.

Dr. Turtle was twice married and leaves a family of three sons and two daughters, two of the former, Dr. F. W. Turtle and Dr. G. de B. Turtle, being members of the medical profession. Dr. James Turtle and Dr. W. R. M. Turtle (great-nephews) were also present at the funeral.

R. C. ELSWORTH, M.D. EDIN., F.R.C.S. ENG.

THE sudden death at Swansea on May 28th of Dr. R. C. Elsworth, consulting surgeon to Swansea Hospital, has deprived South Wales of the services of a brilliant surgeon. Dr. Elsworth was educated at Edinburgh University, where he qualified M.B., C.M. in 1888, taking his M.D., with honours, three years later. He became assistant to the late Sir Thomas Fraser, regius professor of medicine, who had a high appreciation of Dr. Elsworth's diagnostic skill. Later, as demonstrator of anatomy he acquired the rapid and brilliant handicraftsmanship which marked his career as a surgeon and led to his enjoyment of a large consulting and operating practice. This power of using his hands was exhibited in various directions—in photography and in general mechanics. He was, in fact, richly endowed with the three gifts that go to make a surgeon: diagnostic acumen, a power of manipulation of instruments, and a consummate knowledge of anatomy. Dr. Elsworth's death at the age of 63 is attributed by his friends largely to his exhausting work during the war. He joined the R.A.M.C. at an early stage of the war, and, in addition to his work in Swansea, he had charge of a large hospital at Cardiff, which he visited three days a week.

Before his time was so fully occupied with general surgery Dr. Elsworth was in charge of the ear and throat department of the Swansea Hospital, and his contributions to surgical knowledge included articles in our own columns and elsewhere upon intestinal obstruction, prostatic enlargement, and chronic indigestion regarded as a surgical disease. Dr. Elsworth had a wide circle of friends in South Wales, by whom his loss is keenly felt.

THE LATE DR. W. H. R. RIVERS.

LAST week we published an obituary notice of the late Dr. W. H. R. Rivers. We have now received the following appreciation of Dr. Rivers from Prof. G. Elliot Smith:—

It is difficult, if not impossible, to convey to those who had not the privilege of intimate association with him and acquaintance with his many-sided activities any adequate idea of the extent of the catastrophe involved in Rivers's untimely death. He was a pioneer in many paths of knowledge, all of which were leading to a fuller understanding of human nature, and especially what he himself called "mind and medicine." Tremendous issues in the development of anthropology and psychology were being shaped by him; and his accurate scholarship and breadth of sympathy were essential for extending the appeal of these sciences and his fresh vision of them to men of very different points of view. To him might aptly have been applied what Spinoza said of himself: "I have taken my best pains not to laugh at the actions of mankind, not to groan over them, not to be angry with them, but to understand them."

Rivers did not belong merely to Cambridge or to England: it was his mission to blaze new tracks for the interpretation of the ways of man, and of the nature of the human mind, and the world-wide influence of his teaching was perhaps more fully recognised abroad than at home. In innumerable out-of-the-way corners in the world, in Oceania, India, Africa, and America, devoted disciples of his were working at the problems of early society and were wholly dependent on him not only for their inspiration, but for their contact with the scientific world. Yet, in spite of the wide range of his scientific connexions abroad the number of his friends in this country was extraordinarily large and varied; and his personal influence was a most potent instrument for getting things done, and for inspiring men to do the sort of things he wanted done. This was the result, not merely of his sympathy and understanding, but also of his transparent honesty and unselfish generosity, as well as his wide and exact knowledge and sure judgment. Meticulous as he was about the accuracy of his data, his chief aim was to discover new methods of investigation, and to open up new paths of knowledge. In all his work, whether on the psychological or the anthropological side he was always careful to remind his readers that future investigators would probably have to modify many of his suggestions and destroy many of his theories: his life's work was the formulation of certain problems, and the demonstration of how they should be attacked.

The range of his investigations and the breadth of his knowledge were unique. He achieved distinction as a clinical neurologist, as our foremost authority on the physiology of the sense organs, as the man who played the chief part in building up experimental psychology in England, as the foremost scientific psychiatrist, and as the leader of the school of anthropologists now engaged in revolutionising the methods of ethnology and sociology and building up a new doctrine of human behaviour. It might be supposed that a man who had been engaged in so varied a series of occupations was a rolling stone: but to Rivers all of these activities were closely integrated the one with the other and each of them focused on the same ultimate aim, the examination of the whole range of human experience and the fuller understanding of the human mind. It was one element of the greatness of the man that he was able to maintain this singleness of aim amidst such a diversity of disciplines and to correlate the knowledge garnered in such different fields into one consistent and orderly scheme.

His psychological work in the military hospitals at Maghull, Craiglockart, and Hampstead (Royal Air Force) was of momentous importance. His authority was of material assistance in gaining recognition of the value of psychotherapy; and his scientific investigation of the problems of mental disorder not only threw a flood of light upon the mode of causation and the rational treatment of these troublesome conditions, but it also helped to rescue this important branch of medicine from the extremists on the two sides. His psychological experience of gaining the confidence of all sorts and conditions of men in the military hospitals wrought a tremendous change in Rivers himself, so that when he returned to Cambridge after the war he soon became one of the most influential men in the University; and the confidence which he had gained made him perhaps the most potent force both in the public affairs of the University and in the social and intellectual life of its undergraduates. But his death is a national loss and an incalculable disaster to anthropology and psychology.

HANTS COUNTY HOSPITAL, WINCHESTER.—A new X ray department was opened at this hospital on June 7th. This has been established at a cost of £1500 in a detached special building in front of the main block.

Medical News.

UNIVERSITY OF OXFORD: *Rolleston Memorial Prize.*—The Rolleston Memorial Prize at Oxford, which is open to graduates of Oxford and Cambridge under certain conditions for original research in Physiology, Pathology, Animal and Vegetable Morphology, and Anthropology, has been awarded to Gavin R. de Beer, B.A., Demy of Magdalen College, Oxford.

UNIVERSITY OF LONDON: *Advanced Lectures in Medicine.*—Prof. A. A. Hijmans Van Den Bergh (of Utrecht) will lecture on the Pathology of Hæmoglobin, on June 21st, at 5 P.M., Sir Frederick Andrewes, F.R.S., presiding. The lecture will be delivered in English.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—An ordinary Council meeting was held on June 8th, with Sir Anthony Bowlby in the chair. Congratulations were given to Sir Berkeley Moynihan on having received the honour of Baronetcy on the occasion of His Majesty's birthday. A report was read from the Court of Examiners respecting candidates found qualified for the Diploma of Fellow, and diplomas were granted to the following 24 candidates (23 men and 1 woman):—

F. J. Anderson, St. Bart.'s; Alice Bloomfield, Edinburgh and St. Mary's; J. F. C. Braine, Durham and Guy's; D. J. Browne, Sydney and London; R. S. Corbett, Cambridge and St. Bart.'s; I. W. Corkey, Dublin and London; E. A. Crook, Oxford and St. Bart.'s; A. R. Dingley, St. Bart.'s; W. B. Foley, St. Thomas's; W. A. Hewitson, Durham and London; S. L. Higgs, Cambridge and St. Bart.'s; J. G. Jones, Guy's; W. McK. H. McCullagh, Belfast and London; G. Massie and C. H. Medlock, Guy's; D. F. A. Neilson, Cambridge and St. Thomas's; S. T. Parker, New Zealand and London; B. H. Pidcock, St. Bart.'s and St. George's; Baron T. Rose, Birmingham; J. P. Ross, St. Bart.'s; J. Victory, Costa Rica and Guy's; H. M. Wharry and W. E. Wilson, St. Bart.'s; and H. B. Yates, Cambridge and St. George's.

The diploma of M.R.C.S. was conferred upon B. O. Hancock, Birmingham University, who has passed the Final Examination of the Conjoint Board.

The Council elected the following members of the Board of Examiners in Anatomy and Physiology for the Fellowship for the ensuing year:—*Anatomy:* Arthur Ralph Thompson, John Ernest Sullivan Frazer, Gordon Gordon-Taylor, William Frederick Haslam. *Physiology:* Arthur Rendle Short, John Mellanby, David de Souza, Ffrangcon Roberts. The Council elected the following examiners under the Conjoint Examining Board in England for the ensuing year:—*Elementary Biology:* Thomas William Shore and James P. Hill. *Anatomy:* Frederick Gymer Parsons, David Hepburn, John Basil Hume. *Physiology:* Herbert Eldon Roaf and Charles Arthur Lovatt Evans. *Midwifery:* Cuthbert Lockyer, George Drummond Robinson, Charles Hubert Roberts, Eardley Lancelot Holland. *Diploma in Public Health:* Sir Frederick William Andrewes and Francis Joseph Stevens. *Diploma in Tropical Medicine and Hygiene:* Hugh Basil Greaves Newham and George Carmichael Low. *Diploma in Ophthalmic Medicine and Surgery:* Sir John Herbert Parsons, Herbert Willoughby Lyle, Malcolm Langton Hepburn. *Diploma in Psychological Medicine:* Sir Frederick Mott. The President reported that a Sir Gilbert Blane medal had been awarded to Surgeon-Commander Sidney Wilfred Grimwade, O.B.E., R.N., M.R.C.S., after the Promotion Examination in 1922, and that as a result of a special adjudication medals had also been awarded to the following medical officers of the Royal Navy for distinguished professional zeal and ability displayed throughout their service career and during the war, viz:—Surgeon-Commanders Robert W. B. Hall, Sheldon F. Dudley, O.B.E., and Reginald St. G. S. Bond. The President announced that Mr. W. H. Dolamore's term of office on the Board of Examiners in Dental Surgery would expire on July 26th next, and that the vacancy thus occasioned would be filled up at the ordinary Council on July 27th.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, AND ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—At the recent examination held in Glasgow for the diploma in public health of the Scottish Conjoint Board, the following candidates passed, and were admitted as diplomates in public health:—

Ellen D. Anderson, Ba Kin, John M. Campbell, John Frew, Kenneth A. Gilchrist, Thomas E. Hastings, David Heard, Samuel J. Henderson, Thomas McGowan, Campbell L. Miller, Robert J. Peters, Charles B. Reekie, Margaret T. Rutherford, Marguerite L. Sclanders, David M. Scrimgeour, Margaret M. Stuart, Ralph P. Smith, George Taylor, and Anna M. Williams.

ROYAL COLLEGE OF SURGEONS IN IRELAND: ANNUAL ELECTIONS.—The annual elections at the Royal College of Surgeons roused little interest this year, as there was no contest for any of the principal offices. Sir William I. de C. Wheeler passes from the Vice-President's chair to that of the President, of the duties of which he has had considerable experience, owing to the long illness of his predecessor, the late Mr. Edward Taylor. The new President is on the surgical staff of Mercer's Hospital, is a graduate of Trinity College, and a Fellow of the Royal College of Surgeons in Ireland since 1905. He has been for many years a member of the Council of the College, and received a knighthood in recognition of his war services. The new Vice-President, Mr. R. C. B. Maunsell, is also on the surgical staff of Mercer's Hospital. Like the President, he is a graduate of Trinity College, and has been for many years a member of the Council of the Royal College of Surgeons in Ireland. He frequently contributes to the surgical journals. During the war he served in France as a member of the staff of 83rd (Dublin) General Hospital.

DURHAM UNIVERSITY MEDICAL GRADUATES' ASSOCIATION.—A meeting of this Association, of which Prof. John Eyre is president, will be held at 11, Chandos-street, London, W.1, at 5 P.M., on July 6th, to be followed the same evening at 7.30 P.M., by a dinner at the Café Royal. It is hoped that many of the medical graduates of the University who are not yet members of the Association will attend the meeting or the dinner. The secretary for the south is Dr. J. K. Haworth, St. Mary's Hospital, London, W.

AUXILIARY ROYAL ARMY MEDICAL CORPS FUNDS.—The annual meeting of this fund was recently held at 11, Chandos-street, Cavendish-square, and in the absence of the President, Sir John Goodwin, Col. W. Collier, vice-president, occupied the chair. Since the last annual meeting, £1778 have been granted to help the maintenance of the orphans of 36 officers in the Auxiliary Royal Army Medical Corps, who lost their lives as a result of the war; and £2471 have been granted in the same way to the widows and orphans of 96 of the rank and file, making a total of £4294 granted, and 135 cases relieved in a single year. As frequently several children of a single case were relieved, the total number of persons relieved was considerable. The major part of the income of the fund is derived from subscriptions, and the committee hope that these will continue to be sent to the hon. secretary at the above address.

INTERNATIONAL UNION AGAINST TUBERCULOSIS.—The third International Conference will be held at Brussels from July 11th to 13th. Those taking part will include Mr. Berryer, Belgian Minister of the Interior; Sir Robert Philip, President of the International Union; Dr. Dewez, president of the Conference; and Dr. Léon Bernard, secretary of the International Union. The subjects for discussion are: 1. Tuberculosis in the Child—(*a*) Before School Age; (*b*) During School Life, to be opened by Prof. Debré and Dr. Fergus Hewat. 2. Anti-Tuberculosis Prophylaxis in the Home by the Visiting Nurse, to be opened by Dr. Sand and Miss C. Olmsted. 3. The Work of the Tuberculous during and after Cure, to be opened by Dr. Thomas Ridner. On July 13th, at 3 P.M., Prof. Calmette will lecture on the Problem of Immunity in Tuberculosis. Visits will be organised to the different anti-tuberculosis establishments in Belgium. The subscription for ordinary members attending this Conference is £1. Those who wish to become members are requested to send in their names and addresses with subscription by June 26th, to the Secretary, N.A.P.T., 20, Hanover-square, London, W. 1.

HEALTH WEEK (OCT. 8TH–14TH).—Arrangements are being made by the Health Week Committee appointed by the Royal Sanitary Institute for the promotion of Health Week, which is to be held under the patronage of H.M. the King and H.M. the Queen, from Oct. 8th to 14th. The object of Health Week is to focus public attention for one week in the year on matters of health, and to arouse that sense of personal responsibility for health, without which all public work, whether by the Government or local authorities, must fall short of its aims. It is proposed that the dominant idea for 1922 should be "Self-Help in Health," and the consideration of what each individual can do for himself and his neighbour in securing a healthy life. The manner in which Health Week is observed in each district is to be determined by local committees representing every class and profession. The Health Week Committee is working in close coöperation with the National Baby Week Council, and it has been found convenient in several cases to combine the celebration of Health Week and Baby Week. Inquiries should be addressed to Mr. E. White Wallis, secretary, Royal Sanitary Institute, 90, Buckingham Palace-road, London, S.W.

ST. THOMAS'S HOSPITAL MEDICAL SCHOOL.—The prizes will be distributed by the Duke of Connaught on June 21st, at 3 P.M., in the Governors' Hall.

MEDICAL OFFICERS OF SCHOOLS ASSOCIATION.—A meeting will be held at 11, Chandos-street, Cavendish-square, W. 1, on Monday, June 26th, at 5 P.M., when Prof. F. S. Langmead, Dr. W. P. S. Branson, and Dr. James Kerr will introduce a discussion on Cardiac Children as a Public Health Problem.

RESEARCH DEFENCE SOCIETY.—The annual general meeting will be held at the house of the Medical Society of London, 11, Chandos-street, Cavendish-square, London, W. 1, on June 27th, at 3.30 P.M. The chair will be taken by Lord Knutsford. A short address will be given by Sir Walter Fletcher on Medical Research and National Life.

LONDON DERMATOLOGICAL SOCIETY.—The annual general meeting of the society will be held at 4.30 P.M. on June 20th at St. John's Hospital, 49, Leicester-square, London, W.C. 2, to be followed by a clinical meeting. The annual oration on the Progress of Dermatology will be delivered on July 13th by Dr. T. Caspar Gilchrist, of Baltimore.

THE annual meeting of the Overseas Nursing Association will be held at Kent House, Knightsbridge, London, S.W. 7, at 3.30 P.M., on June 21st, when Lord Gladstone will preside, and the speakers include Dr. Andrew Balfour and Dr. Arthur Stanley, formerly commissioner of public health at Shanghai.

CONFERENCE ON INHERITANCE OF MENTAL QUALITIES.—On the occasion of the annual general meeting of the Eugenics Education Society at the Rooms of the Royal Society, Burlington House, Piccadilly, London, on July 4th, at 5.30 P.M., a conference will be held on the Inheritance of Mental Qualities, Good and Bad, in which Dr. A. F. Tredgold, Dr. C. H. Bond, Dr. Bernard Hollander, Mr. R. A. Fisher, and others are expected to take part.

MANCHESTER ROYAL INFIRMARY.—The annual report states that during 1921 the number of in-patients treated, including those in the Barnes Convalescent Hospital, was 12,738; the out-patients numbered 47,164, giving a total of 59,902. The cost of each bed occupied was £166 1*s.*, the average cost per patient £7 16*s.*, the cost of each patient per week £3 1*s.* 10*d.* The expenditure for 1921 exceeded income by £23,255. The infirmary, owing to its association with the medical school of the University, is necessarily involved in a larger expenditure than are hospitals where no medical school is attached. Interesting reports are included on the special X ray and electrical departments, and on the recently instituted special laboratory for the use of the instrumental methods employed in the study of heart disease.

LIVINGSTONE COLLEGE COMMEMORATION DAY.—This event was held on June 9th, when the Secretary of State for Scotland presided. The Principal, Dr. Tom Jays, gave a résumé of the year's work. Fifty-one students of eight nationalities and representing 26 missionary societies had attended the College during the vacation course in July and the present session. Six hundred old students have gone to the mission field. Mr. R. L. Barclay, treasurer, made a statement on the financial position of the College, asking for increased support and emphasising the immediate need of about £500 to meet urgent present liabilities. Mr. Munro, Secretary of State for Scotland, said that such a training as was given at Livingstone College was not only proper but essential for men and women who would be situated at distant outposts of the Empire, far removed from medical advice and skill. He appealed to missionary societies to send students for a short course if they cannot afford a long course, but at any rate for a time to this institution, since it was a crime to send a man or woman to the mission field without even a smattering of medical knowledge. He appealed also for means to equip the College with a number of modest bursaries; this would pave the way for many a student's career. Money was also needed to clear off the debt and thus to enable the College to extend and develop on broader lines. Rev. F. L. Marler, an old student, of the London Missionary Society, S. India, told of the advantage of the Livingstone College training to any missionary going to India. Rev. H. F. Burroughs, a missionary of the Moravian Missionary Society, who had been working on the borders of Thibet, at a station some 16 days from a medical man, said that Livingstone College was an asset to the medical missionary, and also to the Government, and told of many cases where the Livingstone College training had helped him in his work. A vote of thanks to the speakers was proposed by Mr. W. McAdam Eccles, and seconded by the senior student, Rev. A. D. Helser.

Dr. Edwin Bramwell, F.R.C.P. Lond. & Edin., F.R.S. Edin., has been appointed to the Moncrieff-Arnott chair of clinical medicine in the University of Edinburgh, rendered vacant by the death of Prof. Francis D. Boyd.

Sir Alfred Mond will, it is understood, shortly introduce a Bill postponing sine die the operation of the Milk and Dairies Act, 1914. Clean milk production is to be stimulated by the granting of certificates of quality.

THE seventh annual meeting of the National Council for Combating Venereal Diseases will be held in the Robert Barnes Hall, 1, Wimpole-street, London, W., at 4 P.M. on June 19th, when Lord Gorell will preside and give a valedictory address.

ROYAL MICROSCOPICAL SOCIETY.—A meeting of the society will be held in the Lecture Hall at 20, Hanover-square, London, W. 1, on June 21st, at 7.30 for 8 P.M., when the following papers will be read: Mr. A. Chaston Chapman, The Use of the Microscope in the Brewing Industry; Mr. A. Brooker Klugh, The Plunger-Pipette; Mr. E. A. Spaul, B.Sc., The Gametogenesis of *Nepa cinerea* (Water Scorpion).—The annual conversazione of the society will be held at the Examination Hall, 8, Queen-square, Bloomsbury, London, W.C. 1, on Wednesday, Oct. 11th. Offers of assistance from Fellows of the society who can bring exhibits will be greatly appreciated by the honorary secretaries.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—Mr. Victor Bonney will resume his Gynæcological Talks on Saturday, June 17th, at 12 noon, at the House of the Royal Society of Medicine, 1, Wimpole-street, London, W. 1. These Talks have been much appreciated in former years, and post-graduates will no doubt be glad to avail themselves of this opportunity. The next post-graduate lecture at the Royal Society of Medicine will be delivered by Prof. H. MacLean on Recent Work on Albuminuria and Glycosuria, on Monday, June 19th, at 5 P.M. A detailed syllabus of the post-graduate course on children's diseases, to be held from July 3rd to 8th, at the East London Hospital for Children, Paddington Green Children's Hospital, Victoria Hospital for Children and Queen's Hospital for Children, and the Middlesex Hospital, has now been issued and can be obtained from the Secretary of the Federation, at 1, Wimpole-street, W. 1.

DONATIONS AND BEQUESTS.—Under the will of the late Colonel Harry Littlewood, who during the war was administrator of the Second Northern General Hospital, Leeds, the testator bequeathed £1000 to the University of Leeds upon trust for investment, and to apply the income in providing annual or biennial prizes in the anatomy department, to be awarded by, and at the discretion of, the professor of anatomy for the time being.—The late Miss Maria Adelaide Sigel, of Bournemouth, left by will, among other bequests, £500 to the Hospital for Sick Children, Great Ormond-street, W.C., £200 to the Middlesex Hospital for the cancer ward, and £200 to the Royal Free Hospital. Subject to certain life bequests she left the residue of her property to be divided between the London Hospital, St. George's Hospital, Queen Charlotte's Lying-in Hospital, Royal Northern Hospital, Brompton Hospital for Consumption, and the Samaritan Free Hospital for Women.—A gift of £5000 by Messrs. Greenall, Whitley and Co., brewers, of St. Helens, has been apportioned as follows: £1000 each to St. Helens Hospital, Providence Free Hospital (St. Helens), Devonshire Hospital, Buxton, and Southport Convalescent Home; £500 each to St. Helens District Nurses Fund and St. Helens Crippled Children's Aid Society. The gifts to the hospitals are for the endowment of beds for the use of St. Helens people in memory of the men who fell in the war.—Mr. Edward Healey, of Rochdale, bequeathed £500 to the Rochdale Infirmary and £250 each to the Crippled Children's Union, Poor Children's Moorland Home, and District Nurses Association of Rochdale.—Wigan Infirmary has received from the executors of the late Mr. Collin J. Cartwright £4709 for the provision of an operating theatre. The money was raised during his mayoralty of Wigan.—The Manchester Royal Infirmary and the Barnes Convalescent Hospital at Cheadle have been granted £8300 by the Voluntary Hospitals Commission.—The Royal Infirmary has received legacies of £500 from Sir James E. Jones, £410 from Thomas Southerst, £200 from Mrs. Sarah Bolton, and donations amounting to £140.—By the will of the late Sir Charles Rushworth Watson the Middlesex Hospital will receive £500.—The Royal Northern Hospital, Holloway-road, London, has received £500 from the executors of the late Miss Amy Hill, £1050 to endow a "Frederick Brazil Bed" from the executors of the late Mr. Frederick Brazil, and £1000 from the executors of the late Mr. Joseph Grisby Spencer.

Parliamentary Intelligence.

HOUSE OF COMMONS.

MONDAY, JUNE 12TH.

Home-made and Imported Spirits.

Mr. LINDSAY asked the Chancellor of the Exchequer the number of proof gallons of home-made spirits distilled during the year ended March 31st, 1922; exported during the same year; retained for home consumption during the same year; exported as medicinal preparations during the same year; remaining in bonded warehouses on March 31st, 1922; the quantity of imported spirits duty paid and retained for home consumption during the year ended March 31st, 1922; brandy, rum, geneva and other unenumerated spirits tested and not tested.—Sir R. HORNE replied: The quantity of home-made spirits distilled, the approximate quantities, under certain heads, distributed in the financial year ended March 31st, 1922; and the quantity remaining in bonded warehouses on this date were as follows. The quantities are given in proof gallons (p.g.): Home-made spirits, *distilled*, 36,597,788 (p.g.); Home-made spirits, *distributed:* Retained for home consumption, 14,536,226 (p.g.); exported, 5,569,780 (p.g.); exported as medicinal preparations, 137,558 (p.g.); Home-made spirits remaining in bonded warehouses on March 31st, 144,210,170 (p.g.). The approximate quantities of imported spirits retained for home consumption in the financial year ended March 31st, 1922, were: brandy, 795,713 (p.g.); rum, 1,803,161 (p.g.); geneva, 96,868 (p.g.); spirits, other sorts tested, 411,004 (p.g.); spirits, not tested, 936 liquid gallons.

Key Industries Act and Research.

Major MACKENZIE WOOD asked the President of the Board of Trade whether his attention had been drawn to the statement by Sir J. J. Thomson, O.M., F.R.S., in his recent presidential address to the Institute of Physics, to the effect that the Safeguarding of Industries Act had increased the difficulties of research in this country; that he had lost more time since the war by the use of imperfect materials than in the previous 40 years he had been working; that over and over again apparatus which had taken a fortnight or three weeks to construct had cracked during the next night with the result that the whole thing had to be repeated; and whether he would consider Sir J. J. Thomson's suggestion that a system of licences under the Act for research institutions should be set up.—Mr. BALDWIN replied: I have not seen the precise statement quoted by the hon. and gallant Member, but I am aware of Sir J. J. Thomson's general attitude on this matter, and that he did refer to difficulties alleged to be caused by the Safeguarding of Industries Act. I would point out, however, that the inferiority of apparatus and materials cannot be ascribed to that Act, since there is no prohibition of importation, and the duty is not of sufficient magnitude to deter an investigator from obtaining foreign goods if their quality is appreciably higher than that of the domestic products; and I may add that there is conclusive evidence that Germany is far from maintaining her pre-war standard of quality. The answer to the last part of the question is in the negative.

Dr. MURRAY asked the President of the Board of Trade whether his attention had been drawn to a statement by the director of the Royal Technical College, Glasgow, that certain organic chemicals obtained from British firms in this country had been found impure and useless for research and experiment; and whether he could take steps to secure to such scientific institutions the necessary materials with which to carry on their work. Dr. NATHAN RAW asked the President of the Board of Trade whether he was aware that the secretary of the Royal Holloway College stated that, as a result of the passing of the Safeguarding of Industries Act, practically all research was greatly hindered by the necessity of preparing compounds which formerly could be bought, and that at the present time research students at the College spent from one-third to one-half of their time in preparing such compounds; and whether the Government could do anything to assist these students in this matter.—Mr. BALDWIN replied: I am aware that statements of the kind quoted have been made, but I would point out that imports are not prohibited, and suggest that it would be a useful course for research workers and others concerned to place themselves in direct communication with British makers of fine chemicals who will, I am confident, welcome any detailed criticism and coöperation in the development of the British industry to their mutual advantage.

Dr. MURRAY asked the Chancellor of the Exchequer whether he was aware that the chemistry department of the University College, Dundee, had stated that the Safeguarding of Industries Act had put an additional tax on the department, particularly in the provision of materials for research; that research work was undoubtedly hampered by the Act; that they had had to abandon certain work which they would have undertaken had the cost of materials been less; and whether he would consider raising the public grants to such institutions by the amount of the tax imposed on them by the Act.—Sir R. HORNE replied: I have not seen the statement to which the hon. Member refers. I doubt, however, if the increased cost of research can be properly ascribed except to a very limited extent to the operation of the Safeguarding of Industries Act in view of the great increase in cost of all kinds in recent years, and I hope that the stimulus given by the Act to scientific work in industry in this country will more than offset any disadvantages. The distribution of Exchequer grants to universities and colleges is made after a very careful consideration of their individual needs, and I cannot undertake to direct a specific increase as suggested in the question.

TUESDAY, JUNE 13TH.

The Ronald True Case.

Replying to a question by Mr. STANLEY HOLMES as to whether he had any statement to make in regard to his action in ordering the detention as a criminal lunatic of Ronald True, Mr. SHORTT (Home Secretary) said he understood that his action was criticised on two grounds: (1) that he need not have instituted any inquiry into the mental condition of True; and (2) that having received the report certifying him insane he need not have acted upon it. The section under which he acted—Section 2 Subsection 4 of the Criminal Lunatics Act, 1884—stated:—

"In the case of a prisoner under sentence of death, if it appears that the Secretary of State, either by means of a certificate by two members of the visiting committee of the prison or by any other means, that there is reason to believe such person to be insane, the Secretary of State shall appoint two or more legally qualified medical practitioners, and such medical practitioners shall forthwith examine the prisoner and inquire as to his sanity, and after such examination and inquiry such practitioners shall make a report in writing to the Secretary of State as to the sanity of the prisoner, and they or the majority of them may certify in writing that he is insane."

These doctors gave evidence at the trial, as did two other medical men, to the effect that in their judgment the prisoner was certifiably insane. What were the grounds for an inquiry in this case? He (Mr. Shortt) had the reports of two prison doctors who had had the prisoner under close observation for two months. There were, in fact, two issues which were quite distinct. The first was—Was the prisoner at the time he committed the offence insane within the limit of the doctrine of criminal responsibility as laid down by the courts? That was a question on which the jury gave an answer. The further question which arose under the Act was whether the prisoner at the time of the statutory inquiry, being then under sentence of death, was insane within the meaning of the ordinary law so that he could be certified and removed to an asylum. That question was left by the Statute to the unfettered judgment of two or more medical men, and in instituting such an inquiry he (the Home Secretary) was in no way running counter to the views of the judges. On the contrary, the judge who tried the case in the first instance in reporting that he had passed sentence of death drew his special attention to the medical evidence as affording matter for his (Mr. Shortt's) further consideration; while at the conclusion of the appeal, which was dismissed, the Lord Chief Justice said there were certain powers vested on the Home Secretary which, in a proper case, were always exercised. If under these circumstances he had neglected to put the provisions of the Statute into operation by neglecting a medical inquiry he would have been guilty of a flagrant breach of public duty, and when challenged he would have had no defence. On the question whether he was bound to act on the medical report, Mr. Shortt said that the principle that an insane man should not go to execution had been enshrined in the law of this country for at least 300 years. Mr. Shortt concluded his statement by quoting a number of legal authorities, including Sir Edward Coke, for the legality of the action he had taken.

Mr. STANLEY HOLMES failed to obtain leave to move the adjournment of the House on the matter, only 28 Members rising in support.

Ministry of Health Vote.

On a vote of £13,512,562 for the salaries and expenses of the Ministry of Health,

Sir A. MOND (Minister of Health) said the net reduction which he had been able to effect in the total estimates for 1922–23 was £1,732,000. He had done somewhat better than the recommendation of the Geddes Committee. The principle upon which he had proceeded was that he had not agreed to any reduction in services which were already in existence and established their utility, and which it would have been anything but a real economy to diminish. The public health services, such as the treatment of tuberculosis,

maternity and child welfare, and the treatment of venereal disease, were maintained on the same level of efficiency as last year, and he had even endeavoured somewhat to improve upon that. In order to do that he had found it necessary to make considerable reductions in administration. The staff of the department had been reduced from 6462 to 4132, and salaries, wages, and allowances had been decreased by £655,000. He hoped to be able to make further economies in the future. Referring to the question of the establishment of a central school of hygiene and preventive medicine in connexion with the University of London, Sir A. Mond said that the necessity for and advantage of such an institution was acknowledged by all who had studied the matter. At present the teaching of these very important subjects, not only for the metropolis, but for the whole country, for the Empire, and the world, had to be carried out in ten medical schools. It was impossible to specialise and give the necessary accommodation for research. This was perhaps the most important work which medical science had to do in the future. The recommendation of a committee which sat in 1921 on this subject was endorsed by the University Grants Committee of the University of London and a scheme was drafted by a departmental committee appointed by himself. One difficulty was finance, but fortunately in this case the Rockefeller Institute of America, which possessed very large funds and a very large heart, took a very big view of its obligations on this subject and had promised a sum of 2,000,000 dollars (£400,000) to found a school of hygiene in London, on condition that the necessary money was found for staffing and maintaining the school. He (Sir A. Mond) had got a promise that if he could do that work for £25,000 he could have the money. A site had been chosen and a curriculum was being arranged. He hoped that in a couple of years this important service would be started, which would benefit the whole world.

Lord Cave had laid the foundation of an organisation which, owing to the very able and enthusiastic administration of Lord Onslow, was really going to enable them to continue the voluntary hospital system. It was a very creditable thing that in spite of the high taxation and the high cost of living the subscriptions to the hospitals had not been substantially diminished. The total grants paid to date by the Voluntary Hospitals Commission were £103,000 in London and £39,000 in the provinces. The remaining money was still in hand. The network of committees which had been set up all over the country were going to do very good work and very good results were already being obtained. The British Hospitals Association had been doing excellent work and he wished to say a word of thanks to the approved societies for what they had been doing out of their valuation surpluses.

Progress was reported.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Tuesday, June 20th.

GENERAL MEETING OF FELLOWS: at 5 P.M.
Ballot for Election to the Fellowship. (Names already circulated.)

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 11, Chandos-street, W. 1.
THURSDAY, June 22nd.—At 8.15 P.M., Annual General Meeting.
Papers by Dr. E. de Verteuil: Anopheles and Malaria Control in the Brighton-La Brea Rural Sanitary District, Trinidad. (Illustrated by lantern slides.) Dr. Arthur Powell: House Incidence of Sprue suggesting its Infective Nature. Dr. E. P. Minett: A Cheap Type of School Latrine for Country Districts in the Tropics, in Relation to Ankylostomiasis and other Diseases.
The meeting will be preceded by a Demonstration at 7.15 P.M. by Dr. A. C. Stevenson on Trypanosomes in the Brain of a case of Chronic Sleeping Sickness.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.
TUESDAY, June 20th.—5 P.M., Croonian Lectures (4), Dr. Gordon Holmes: The Symptoms of Cerebellar Disease and their Interpretation.

UNIVERSITY OF LONDON.
ADVANCED LECTURES IN MEDICINE (at the Royal Society of Medicine, 1, Wimpole-street, W. 1).
WEDNESDAY, June 21st.—5 P.M., Dr. A. A. Hijmans van den Bergh (Utrecht): The Pathology of Hæmoglobin.

FELLOWSHIP OF MEDICINE POST-GRADUATE LECTURES, 1, Wimpole-street, W. 1.
MONDAY, June 19th.—5 P.M., Prof. H. Maclean: Recent Work on Albuminuria and Glycosuria.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, Bloomsbury, W.C. 1.
POST-GRADUATE COURSE: May-June, 1922.
CLINICAL LECTURES AND DEMONSTRATIONS.
MONDAY, June 19th.—2 P.M., Dr. Hinds Howell: Out-patient Clinic. 3.30 P.M., Mr. Leslie Paton: Optic Atrophy.
TUESDAY, June 20th.—2 P.M., Dr. Grainger Stewart: Out-patient Clinic. 3.30 P.M., Dr. Risien Russell: Treatment of Syphilis of the Nervous System.
WEDNESDAY, June 21st.—2.15 P.M., Dr. Walshe: Clinical Demonstration.
THURSDAY, June 22nd —2 P.M., Dr. S. A. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Bailey: Electrical Testing of Muscle and Nerve.
FRIDAY, June 23rd.—Dr. Gordon Holmes: 2 P.M., Out-patient Clinic; 3.30 P.M., Cerebral Tumours.
Mr. Armour and Mr. Sargent operate at the Hospital on Tuesday and Friday mornings at 9 A.M., or at such other times as may be announced.
NEURO-PATHOLOGY.—Dr. J. Godwin Greenfield.
MONDAY, June 19th.—12 noon, Syringomyelia and Motor Neuron Disease.
THURSDAY, June 22nd.—12 noon, Disseminated Sclerosis and Subacute Combined Degeneration.
ANATOMY AND PHYSIOLOGY OF THE NERVOUS SYSTEM.—Dr. Kinnier Wilson.
TUESDAY, June 20th.—12 noon, Forebrain: Structure and Tracts.
FRIDAY, June 23rd.—12 noon, Forebrain: Localisation of Function.
Particulars of fees, &c., apply to
C. M. HINDS HOWELL, Dean of Medical School.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY, June 19th.—10.30 A.M., Mr. Maingot: Surgical Pathology. 12.15 P.M., Dr. Burnford: Pathological Demonstration. 5 P.M., Dr. Saunders: Nephritis in Children.
TUESDAY.—10 A.M., Dr. Paterson: Demonstration of Medical Cases. 12 noon. Mr. Sinclair: Appendicitis. 5 P.M., Mr. Tyrrell Gray: Paralytic Ileus.
WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 12 noon, Mr. Simmonds: Demonstration of Fractures. 5 P.M., Mr. Donald Armour: Surgery of Spine and Spinal Cord.
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Cases. 12 noon, Dr. Scott Pinchin: Diseases of the Heart. 5 P.M., Sir W. P. Bassett-Smith: Mediterranean Fever.
FRIDAY.—10 A.M., Mr. Simmonds: Demonstration of Surgical Cases. 2 P.M., Mr. Banks-Davis: Diseases of Nose, Throat, and Ear. 5 P.M., Mr. MacDonald: Urinary Surgery.
SATURDAY.—9 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children.
Daily 10 A.M. to 6 P.M. 2 P.M., In-patients, Out-patients, Operations, Special Departments.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, Springfield Mental Hospital, Beechcroft-road, Upper Tooting.
WEDNESDAY, June 21st.—4 P.M., Dr. C. E. Lakin: Common Errors in Diagnosis in Regard to the Chest.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C. 1.
THURSDAY, June 22nd.—4 P.M., Dr. Gray: Tuberculosis of the Skin (Cases).

NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W. 1.
MONDAY, June 19th.—5.30 P.M., Dr. J. Parkinson: Auricular Flutter.

MANCHESTER FRENCH HOSPITAL, 24, Acomb-street, Whitworth Park, Manchester.
THURSDAY, June 22nd.—4.30 P.M., Dr. S. Herbert: Post-Graduate Lecture: Hypnotism and Psycho-Analysis.

Appointments.

HENDRY, W. B., L.R.C.P.& S. Edin., L.R.F.P.S.G., has been appointed Chief of the Department of Gynæcology and Obstetrics, Medical Faculty, University of Toronto.
MANN, IDA C., M.B., B.S. Lond., Ophthalmic Surgeon to the Elizabeth Garrett Anderson Hospital.
TATTERSALL, C. H., L.R.C.P. Lond., M.R.C.S., L.S.Sc. Durh., Honorary Consulting Medical Officer of Health for Salford.
URQUHART, A., M.D. Aberd., D.P.H., Medical Officer of Health, Staines Rural District Council.
WILSON, J. E., M.D., B.Ch., B.A.O. R.U.I., D.P.H., Medical Officer of Health for Mansfield.

Vacancies.

For further information refer to the advertisement columns.
All Saints' Hospital for Genito-Urinary Diseases, Vauxhall Bridge-road, S.W.—Res. H.S. £120. Hon. Surg. Reg.
Bath, Royal United Hospital.—Jun. H.S. £150.
Bethlem Royal Hospital, Lambeth-road, S.E.—Pharmacist. £250.
Birmingham, Ministry of Pensions Hospitals, Moseley.—Two J.M.O.'s. £350 each.
Bishop's Castle, Salop, Clun Union.—Dist. M.O. £57.

Bristol Royal Infirmary.—Sen. Res. O. £200. Res. Obstet. O., H.S.'s and H.P.'s. Each £120. Also Obstetrician.
Cancer Hosp., Fulham-road, S.W.—Asst. to Research Dept. £700.
Carshalton, Surrey, Queen Mary's Hospital for Children.—Sen. Asst. M.O. Also Jun. Asst. M.O. £645 5s. and £515 6s. respectively.
Dewsbury and District General Infirmary.—H.S. £200.
Eastern Dispensary, Leman-street, E.—Gynæcologist.
East London Hosp. for Children, &c., Shadwell, E.—Asst. S. £50.
Elizabeth Garrett Anderson Hosp., Euston-road, N.W.—Clin Assts.
Exeter, Royal Devon and Exeter Hospital.—Asst. H.S. £150.
Erminster, Devon Mental Hospital.—Third Asst. M.O. £300.
Gartloch Mental Hospital, Gartcosh, near Glasgow.—Locum Tenens. £350.
General Lying-in Hospital, York-road, Lambeth, S.E.—Res. M.O. £100.
Grimsby and District Hospital.—H.S. £300.
Hampstead General Hospital, Haverstock Hill, N.W.—Gynæc.
Hellingly, Sussex, East Sussex County Mental Hospital.—Jun. Asst. M.O. £350.
Hospital of St. John and St. Elizabeth, 40, Grove End-road, N.W. Asst. P.
Kingston, Canada, Queen's University.—Chair of Preventive Medicine. $3500.00.
Leeds City Infectious Diseases Hospital, Seacroft.—Second Asst. M.O. £250.
Leeds Township Infirmary.—Asst. M.O. £380.
Lenham Sanatorium, Kent.—A.M.O. £400.
Lewisham Hospital, S.E.—Fourth Asst. M.O. £100.
Lincoln County Hospital.—Jun. H.S. £150.
Macclesfield General Infirmary.—Sen. H.S. £200.
Manchester, Ancoats Hospital.—Hon. Radiologist.
Manchester Royal Infirmary.—Surg. Reg. £150.
Manchester, St. Mary's Hosp. for Women and Children.—H.S. £100.
Metropolitan Hospital, Kingsland-road.—Asst. Physician.
Newcastle-on-Tyne Dispensary.—Res. M.O.—£350.
Newcastle-upon-Tyne, Hospital for Sick Children.—Jun. Res. M.O. £150.
Newport, Mon., Royal Gwent Hospital.—H.S. £200.
Nottingham General Hospital.—Two H.P.'s £200.
Queen Charlotte's Lying-in Hospital, Marylebone-road, N.W.—Asst. Res. M.O. £60.
Queen's Hospital for Children, Hackney-road, E.—Cas. H.S. £100. Also Asst. S. and Asst. P.
Royal London Ophthalmic Hosp., City-road, E.C.—Sen. H.S. £150.
Royal National Orthopædic Hospital, 234, Great Portland-street, W.—H.S. £150.
Royal Northern Hospital, Holloway, N.—Cas. O. £200.
Salop County Council.—A.M.O. £550.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—H.S. £100.
Sheffield Royal Infirmary.—Two H.P.'s, H.S., Ophth. H.S., and Asst. Cas. O. Each £150.
Southampton, Royal South Hants and Southampton Hospital. H.P. £150.
South London Hospital for Women, Clapham Common, S.W.—H.S. and H.P. Each £100.
South Shields, Ingham Infirmary.—Sen. and Jun. H.S.'s. £200 and £150 respectively.
University College Hospital, Gower-street, W.C.—Half-time M.O. £250.
West London Hospital, Hammersmith-road, W.—Two H.P.'s and H.S. Each £100.
West Middlesex Hospital, Isleworth.—Asst. Med. Supt. £300.
Westminster Hospital, Broad Sanctuary, S.W.—Asst. H.P. and Asst. H.S. £52.
West Riding of Yorkshire County Council.—Chief Tuberc. O. £750.
Winchester, Royal Hampshire County Hospital.—H.P. £150.

The Chief Inspector of Factories, Home Office, London, S.W., announces the following vacant appointments: Chirnside (Berwick), New Southgate (Middlesex), Royton (Lancaster), Wainfleet (Lincoln).

Births, Marriages, and Deaths.

BIRTHS.

BOYD.—On June 5th, at Belsize Park-gardens, N.W., the wife of Sidney Boyd, M.S., F.R.C.S., of Harley-street, W., of a son.

HOLMES.—On June 5th, at Harley-street, W., the wife of Gordon Holmes, C.M.G., M.D., F.R.C.P., of a daughter.

MARRIAGES.

COMPTON—HILL.—On June 10th, at the British Embassy Church, Paris, Arthur Compton, M.B., D.Sc., to Ellen Hill, eldest daughter of Mr. and Mrs. James Hill, Manchester.

WAYLAND-SMITH—BUTLER.—On June 7th, at St. John's Church, Devizes, Richard Wayland-Smith, M.B., F.R.C.S. Edin., to Gladys Marjorie, only daughter of Sir Reginald Butler, Bart., and Lady Butler, of Old Park, Devizes.

DEATHS.

GAINER.—On Whit Sunday, at Belmont House, Thrapston, Northamptonshire, Joseph William Gainer, M.D., J.P., aged 63.

LEVER.—On June 6th, at Denton House, Iffley, Oxford, Reginald Croft Lever, Major, late R.A.M.C., aged 83.

THORBURN.—On the 11th inst., very suddenly, at Newbury, Victoria Park, Manchester, Augusta, Lady Thorburn, wife of Sir William Thorburn, Surgeon, and daughter of the late W. E. Melland, Esq.

TURTLE.—On June 6th, at Kirkmead, Woodford, E. 18, Frederick Turtle, M.D. St. Andrews, M.R.C.S. Eng., L.S.A., in his ninetieth year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

THE ORGANISATION OF THE CARE OF MATERNITY.[1]

BY FRANCES IVENS, M.B., M.S. LOND.

IN view of the fact that present-day statistics of puerperal mortality show so little improvement on the past, it is clearly evident that midwifery has so far failed to make the same progress that medicine and surgery have made in the last few decades. But those of us who practise gynæcology are struck rather by the later results of puerperal morbidity, as they present themselves in overwhelming numbers in the out-patient departments. The organisation of a satisfactory maternity service is accordingly a very pressing need. Coördination and coöperation are required; also further education of public opinion as to the advantages of ante-natal care.

Instruction of Students in Ante-natal Care.

Ante-natal care involves the health education of the pregnant woman and careful medical examination and supervision, so that abnormal conditions can be recognised and preventive measures adopted in good time. There is also scope in this work for the trained health visitor. It is obvious that special training is necessary, and it is unfortunate that many municipal maternity schemes have been started apart from training schools of midwifery or medicine, so that (except in the rarest instances) all this valuable teaching material is lost. There is a danger that a large amount of the care of midwifery may be isolated from the field of instruction of the medical student. The municipal maternity homes and the ante-natal clinics are not utilised to any extent for teaching, or at any rate not for the teaching of medical students. The lack of institutional facilities and the curious contempt for midwifery hitherto shown by examining bodies has pushed the practice of this subject until recently into a rushed, scrambling fortnight. This regrettable state of affairs should be remedied. The crowded student curriculum makes it a matter of urgent necessity that teaching facilities should be grouped together by the establishment and extension of teaching maternity hospitals, where all the branches of the work can be studied in their relation to each other, and in the greatest perfection of detail.

We begin, then, with the education of the mother in her home and in the ante-natal clinic. Her natural repugnance to examination must be overcome and the advantages to be obtained from pre-maternity care must be brought into a high light.

Destination of Ante-natal Clinic Cases.

The careful examination of the pregnant women, including pelvimetry, if performed by skilled persons with scientific exactitude, will make the ante-natal clinic into a clearing-house where the cases are sorted and grouped. The normal case will, if home conditions are favourable, stay at home and be attended by her own midwife or doctor, or both; if she prefers it, or if home conditions are adverse, she will go into the maternity home, where there will be somewhat extended facilities. The midwife will be trained to utilise the clinic to her own and the patient's advantage. In each maternity home will be provided beds for the use of pregnant women who require rest or treatment of a simple kind, but it need not be elaborately equipped.

Cases of abnormal pregnancy will be directed on to the central teaching hospital, where wards will be detailed for their reception where exhaustive observations can be made, and suitable treatment given. Such pathological conditions as glycosuria, œdema, albuminuria, hyperemesis, pre-eclamptic conditions, and toxæmias would be best studied in the fully-equipped teaching maternity hospital. An ambulance service must embrace the whole district served by the central maternity hospital, unobstructed by the red tape of conflicting local authorities. The scope of the present teaching maternity hospitals must be extended, if they are fully to meet the needs of their district and supply satisfactory teaching to the large numbers of students requiring instruction. The teaching maternity hospital should be situated in large centres of population provided with specialists prepared to deal with complicated conditions, and should form part of the local medical school.

[1] Abstracted from a paper read at the Congress of the Royal Institute of Public Health held at Plymouth, May 31st to June 5th, 1922, which will appear in full in the Journal of the Royal Institute.

The Ideal Teaching Maternity Hospital.

The hospital would have both out-patient and in-patient departments. In the out-patient department there would be daily consulting ante-natal clinics for abnormal cases, sent up from the local ante-natal clinics, and by doctors and midwives for special investigation, report, or treatment. There would also be a gynæcological post-natal department, where abnormal cases could be examined fairly soon after labour, and minor disabilities such as displacements rectified. In addition a special out-patient department should be created for the investigation and treatment of venereal disease associated with pregnancy, to which cases of repeated abortion or still-births could be referred for examination, or where cases with suspect discharges could be investigated. Such a department would be under the dual care of a specialist in venereal disease and gynæcologist, and would be linked up with wards arranged for the reception of these cases before, during, and after labour. In 1919 such a department was organised by Prof. Couvelaire[2] at the Maternité Baudelocque in Paris, and has given most successful results. The patients submit much more readily to treatment in an institution with which they are already acquainted. The clinic is known as the "Dispensary for the Diagnosis and Treatment of Hereditary Disease." Much tact and perseverance are required to get the best results.

In-patients.

The requirements for in-patients would be :—

1. Ante-natal wards for the study or treatment of abnormal cases of pregnancy.
2. Lying-in wards and labour wards for clean cases.
3. An isolation department for suspect cases, with labour and lying-in wards. To this department would be admitted cases of puerperal fever, so that these could be treated under the direction of obstetrical specialists rather than in fever hospitals.
4. A venereal in-patient department to include ante-natal, maternity, and post-natal cases. To this would be added a ward for gonorrhœal ophthalmiâ, under the dual care of an eye specialist and obstetric surgeon.
5. Post-natal wards with provision for the infant, so that in the case of the mother's illness it shall not be necessary to wean the infant unless her condition demands it.
6. Gynæcological wards for operation cases associated with pregnancy, for Cæsarean sections, and the repair of post-natal traumata. Suitable operating theatres would be associated.

In selecting the staff of the hospital it would be necessary also to appoint physicians specially interested in the care of the new-born infant. In the attached pathological laboratories due provision must be made (1) for the chemical, bacteriological, and histological examination of morbid specimens; (2) for post-mortem examinations. An X ray department would give valuable assistance. Research work would be stimulated under such conditions and facilities should be provided, together with arrangements for post-graduate teaching in advanced obstetrics and gynæcology and gynæcological pathology.

MEDICAL AND SANITARY ADMINISTRATION IN MESOPOTAMIA.[3]

MORE than a year ago the number of medical institutions of all kinds at work in Mesopotamia, now officially known as Iraq, reached a total of 82, including hospitals, dispensaries, a nursing home, X ray institute, disinfecting station, laboratory, &c.; and the medical and nursing personnel was increased from 105 to 128. At Baghdad, where the "New General Hospital" is still "accommodated as a temporary measure in the huts of a former Indian military hospital," 4380 patients were admitted, of whom 303 were British, 1455 Indians, 1007 railway employees, and 2622 local inhabitants. In the out-patient department the total attendances numbered 51,976, the new cases during the year being 15,954. At this hospital 586 operations were performed, of which 135 were for hernia. The deaths during the year numbered 213, of which 37 were from pneumonia, 22 from pulmonary tuberculosis, and 14 from dysentery; 23 deaths are ascribed to accidents, and 15 to gunshot wounds (presumably not accidental). There were only 5 deaths from malaria and 3 from typhoid. Much valuable work was carried out in the pathological laboratory by Dr. D. I. Dakeyne, and his assistant, Dr. Agop Tchobanian; the total examinations numbered 1143, including fæces (305), urines (197), and sputa (193). In regard to dysentery, it was found that in May and early June, 1920, most cases were bacillary (Flexner's bacillus); while after this practically all cases were amœbic. There appears to be very little enteric fever among adult Arabs; only 3 cases, "clinically enteric" and giving Widal reaction, were found, and in none of these was an "enteric group organism" isolated. *B. typhosus* was found three times and *B. paratyphosus* once in either British or Indian patients by blood culture. Dr. Dakeyne considers that "there is probably a considerable amount of enteric disease amongst children which remains hidden." A new laboratory is urgently required, the present building being quite unsuitable for the purpose. Dr. Gordon Spencer reports on the work of the eye clinics or ophthalmic centres; the population is largely affected with eye diseases, especially trachoma and ophthalmia. In the Government schools 77·3 per cent. of the children suffer from trachoma, every one of whom is in danger of going blind, if treatment is withheld. Indeed, Dr. Spencer considers that one of the principal difficulties in this country, scarcity of labour, is "due to high infantile mortality and prevalence of trachoma and ophthalmia, with its accompanying invalidism and blindness."

At the Baghdad East Dispensary some 20,000 patients were treated during the year. Defective dietary, constipation, pyorrhœa alveolaris, and general uncleanliness were the chief conditions leading to disease. The civil hospital for women and children at Baghdad, which had been looted and wantonly damaged by the Turks before their departure in 1917, was put in order and equipped for 144 patients; in 1918 the attendances of out-patients numbered 39,376, there were 1716 in-patients, and 264 major operations were performed; in 1919 the in-patients increased in number to 2045, and the major operations to 477; the out-patient attendances dropped to 35,379. In addition a Serai nursing home was opened in February, 1920, under Miss E. A. Emuss as matron; and a venereal hospital for women, both at Baghdad. At the chemical laboratory a large number of analyses were carried out, and medico-legal examinations.

Lieut.-Colonel J. D. Graham, I.M.S., Director of Medical Services, in his remarks on the Baghdad report, emphasises the overcrowding of the city, the imperfection of the conservancy arrangements, defects of registration, the prevalence of venereal disease, and the importance of a new water-supply for Baghdad East.

At the Basrah Civil Hospital 2507 patients were admitted, of whom 1510 were discharged cured and 97 died; malaria and bronchitis were the chief diseases treated. A special venereal department was opened in November, which "is likely to grow enormously in the near future, both syphilis and gonorrhœa being very widespread in Basrah." There were no epidemics of importance; 27 cases of cholera were admitted in October, and 46 of plague between April and July. At the Basrah dispensary, which is stated to be really the out-patient department of the civil hospital, 13,018 fresh cases were treated, and at the Azhar Dispensary 11,308. The eyes of the children in the Basrah and Azhar schools were examined, and out of 1051 children, 469 were found to be suffering from trachoma and 179 showed distinct scarring from previous attacks that had healed without apparent ill-effects. At Mosul 2213 patients were admitted to the civil hospital, and 61,781 were treated as out-patients. The city is not yet provided with a water-supply; there has, however, been no epidemic disease during the year. At Arbil, in the province of Mosul, there is much malaria, 50·6 of the out-patients suffering from this disease, attributed to a "leaky water-supply"; improvements are being carried out. At Najaf, in the Shamiyah Division, Dr. E. A. L. Samson alludes to the good work done by Compounder Sharafatullah. "He spoke Arabic well, took a great interest in his work, and went out of his way to get to know and understand the people. He frequently went out into the desert, visiting Sheikhs and talking to the men. By this means he overcame their prejudice, and in two months the dispensary was well attended, people coming in from all parts." At Nasiriyah, on the Euphrates, 39,488 patients were treated, of whom 14,477 were fresh cases, trachoma and malaria being the most numerous; bilharziasis is also frequently met with. At Amara it is stated that "the health of the townspeople is extremely good"; as, however, 8248 "local" patients were treated at the civil hospital, which works out at over 580 per 1000 inhabitants, and as Captain P. A. With, R.A.M.C., states that "a large portion of the populace suffer from malaria," it would seem that "good" is not the word. The sanitation of the town has been much improved; and by spraying the rubbish pits with a mixture of kerosene (three parts) and thick oil (one part), and then beating down six inches of earth on top, fly-breeding has been prevented. Malaria is prevalent; 37 out of 95 school children were found to have enlarged spleens. Vaccination is eagerly received; there has been only one small outbreak of small-pox in Amara since its occupation by the British in 1915. The Vaccine Lymph Institute is located here, under Captain With; 6489 grammes were manufactured during the year.

This most interesting report is signed by Lieut.-Colonel J. D. Graham, I.M.S., Director of Health Services, who,

[2] La Presse Médicale, June 4th, 1921.

[3] Administration Report of Health Services. 1920. Baghdad Government Press. February, 1922.

however, states that it was in the main compiled by Lieut.-Colonel W. B. Lane, who acted for him during his absence on leave. It is a record of sanitary achievement, carried out under extremely difficult circumstances, which, it may be said without hesitation could not be surpassed.

Baghdad and Basrah.

The city of Baghdad covers an area of about four square miles, most of which lies on the left bank of the Tigris, and is known as Rusafah, with a mixed population of Mohammedans, Jews, and Christians, estimated at 150,000; on the right bank of the river Baghdad West, or Karkh, has about 50,000 inhabitants. The bulk of the population (134,000) are Mohammedans, Jews number 50,000, and Christians and others, 16,000. The river has an annual rise and fall of about 20 feet, and a river wall has been built to protect the city from flooding; "the high level of subsoil water found in the rainy season and at times of high river level, and the absence of easy levels for drainage and sewerage are unfortunate factors affecting the health of the city." Baghdad East, or Rusafah, is an almost solid mass of houses. There are hardly any open spaces, few streets are suitable for wheeled traffic, and only one main artery, recently constructed from the North to the South Gate, is of any considerable width. The houses, built in solid blocks, generally have a central uncovered courtyard, and most of them are only two storeys high. Overcrowding is almost universal. It is obvious that the sanitation of such a city presents very great difficulties; in every house are one or more cesspools in the central courtyards, brick-lined but not cemented; and in the winter and spring the high level of subsoil water prevents outward percolation. The municipality cannot yet face the cost of a main drainage scheme: a few only of the main streets are provided with surface drainage.

Dr. T. B. Heggs, the medical officer of health for the city, referring to medical education in the province, emphasises the necessity for medical training of the natives of the country, as distinct from the importation of trained persons; what has been found possible in India, Egypt, and Syria can be made possible in Baghdad in a short time. The Majidiyeh Hospital exists as an educational nucleus, and he is sure that no other project than that of a medical college at Baghdad will satisfy the aspirations and needs of the country. There is, he says, an unfortunate prevalence of venereal disease in the city. Dr. Heggs makes numerous recommendations as to the control of prostitutes, free treatment clinics, and educational propaganda, which it is to be hoped will be carried out by the municipal authorities.

The registered birth-rate in 1920 (17·25 per 1000) is stated to be very much too low, owing to defective registration; the death-rate was 19·4, compared with 31·09 in 1919. The total deaths numbered 3889, the most frequent causes being fever (784), marasmus (602), and tuberculosis (493); only 17 deaths are recorded from malaria, and only 12 from typhoid. The ratios per 1000 are unfortunately not stated. An interesting table of meteorological observations (1888–1918) shows that the mean daily extremes of temperature at Baghdad are, maximum 85·8° F., and minimum 59·8°, with an absolute range of 122·8° and 18·6°. The average rainfall is 6·64 mm. During 1920 the maximum temperature exceeded 100° from the second week in June to the middle of September, the highest weekly average maximum being 113·1° in the middle of August. The lowest weekly average minimum was 30·6° in the beginning of December. There was no rain from May 8th until Sept. 25th.

A short report on Azhar and Basrah for 1920 is furnished by Captain T. J. Hallinan, R.A.M.C., the medical officer of health. There were small outbreaks of plague (32 deaths) and cholera (44 deaths). Attempts have been made to institute measures of prevention against venereal disease, provide latrine accommodation, and inspection of food: but no large sanitary work was undertaken on account of the necessity for strict economy in all civil departments.

A MOSQUITO-PROOF HAMMOCK.

IN a recent number of the *Journal* of the Royal Naval Medical Service, Surg.-Lieut.-Commdr. H. B. Padwick, D.S.O., describes a secure mosquito-net for use with a hammock. A tube of mosquito netting 9 feet long is slipped over the hammock and one end is tied up properly round the clews, or supporting lines, at the foot. The tube at the other end is rolled back half-way down the hammock until the man has got in, when he unrolls it over himself and ties its open end, by a drawing tape, round the head clews thus closing the tube. There are spreaders for the net rather longer than the spreaders for the hammock. His men on the West Coast of Africa got quickly used to this new technique for going to bed in comfort, it soon became under discipline second nature, and instead of 89 and 44 cases as in the two previous commissions, *Dwarf* in the writer's commission had only four cases of malarial fever amongst some 80 men, a striking economy of man-power and of cost to the public.

MALARIA IN ARMENIA: URGENT NEED OF EQUIPMENT.

A REPORT has just reached the Armenian Red Cross and Refugee Fund from the Committee at Erivan, stating that malaria, always very widely spread amongst the population of Armenia, is now the most menacing epidemic threatening them. Fifteen per cent. of the population are attacked, and the pernicious form is prevalent. The Committee recommend that in malaria centres sanitary stations should be established, that 1000 kilos of quinine should be distributed free to the people, that swamps should be drained, and a pure water-supply ensured. Over 700,000 persons in Armenia are at present existing on rations provided by foreign relief funds. Donations for the hospitals are urgently needed or offers of supplies of quinine, salvarsan, or any hospital requisites. These will be gratefully acknowledged by the hon. secretary, Miss Emily J. Robinson, at 35A, Elsham-road, London, W. 14.

MEDICAL ATTENDANCE IN WORKING-CLASS DISTRICTS AT NIGHT.

PUBLIC attention is from time to time called at inquests to the difficulty of obtaining medical aid at night for patients in working-class districts. Medical men do not always live where they practise, and can hardly be blamed for not doing so, when they can obtain more suitable homes elsewhere. Medical men, also, with large practices require rest like other workers, or a doctor summoned to attend a stranger in an emergency may have patients of his own who claim his attention. The medical profession is, however, blamed indiscriminately whenever a person suffering from serious illness at night cannot obtain the aid his condition demands. It must be admitted by all that it is highly undesirable in the public interest as well as in that of the medical profession that such incidents should occur.

A recent inquest at Southwark was held on a child who had been suffering from measles and who became seriously ill on a Sunday evening. His mother then endeavoured to obtain a doctor. The medical man whom she sent for was absent from his surgery and not due to return till the following morning, and before he arrived the child had died from heart failure, consequent upon pneumonia. The child's life would probably not have been saved in any case, but Dr. F. J. Waldo, who would not have been holding an inquest if the deceased had been medically treated, questioned the medical man who had been sent for as to the circumstances which explained his absence. Having a large panel practice, about 3400 patients, he could afford to live away from his surgery and did so. No doubt a large practice of this kind is good evidence of the industry of a particular doctor and of the appreciation in which he is held. At the same time, however, he must not be surprised if a coroner's jury thinks that he ought to make arrangements for a qualified assistant or for a partner or other colleague to be prepared to deal with urgent cases during his absence.

STAMMERING—WHAT IS IT?

To the Editor of THE LANCET.

SIR,—It was with interest that I read the article on this subject by Mr. H. St. John Rumsey and the letter of Miss Kate Emil Behnke in your issues of May 13th and June 3rd respectively. Would you allow me to express my opinion based upon 17 years' experience as a specialist for the treatment of stammering? I lay claim to a certain amount of knowledge and experience, as I was myself a severe stammerer till about the age of 22, when I determined to overcome the trouble not alone by clear articulation and self-control, but also by enforced association with strangers.

Stammering, briefly, is the result of everything connected with the individual's mental process, when about to speak or speaking, such as idiosyncrasies, habits, fears, and general nervousness. It is well known that stammerers can usually speak and read aloud when alone in a room, but the great difficulty presents itself when people are present, due to the fact that they are being listened to. Unless these difficulties are explained away and mastered there can be no complete cure.

Get the pupil accustomed to being listened to and looked at in the presence of other pupils and strangers during a course of instruction in articulation and correct breathing when speaking, under strict and continual supervision, and in the majority of cases instant improvement is distinctly noticeable by the evidence of a greater sense of self-control, and the gradual eradication of nerve tension, followed by the ease with which sounds are produced of which words are composed. Words are made of breath, declamation is cultivated without any forcing emphasis, and a natural flow of language follows the persevering practice of my treatment in a few months, often sooner with adults.

I am, Sir, yours faithfully,

119, Bedford Court Mansions, W.C. 1. A. C. SCHNELLE.

VOICE PRODUCTION.

Mr. E. Davidson Palmer, Mus. Bac. (Oxf.), has published a little pamphlet (The Unknown Truth About the Voice and its Development. Pp. 23. 1s.) in order to show that the ordinary methods of voice production, with the accepted division into different registers, is fundamentally wrong, and that this is the cause of the troubles and defects suffered by singers and speakers. He claims to have discovered "that the voice commonly called falsetto is capable of the most extraordinary development from its upper limit downwards throughout its whole range, and may be strengthened and extended to the bottom of the vocal compass, and so completely transformed as to lose the falsetto quality and resemble in fullness and power the ordinary chest register, from which it is then hardly distinguishable, except by its superior quality and the perfect ease with which it is produced." Unfortunately, he supports his thesis by an exaggerated diction, which leads him to call his discovery "one of Nature's profoundest secrets." His arguments will hardly convince his readers that he has found the only proper method of production for most, or all, voices.

THE STANDARD CATALOGUE.

A COMPREHENSIVE catalogue, being Vol. II. of Physiological, Histological, and Biochemical Apparatus and Instruments, by Messrs. Baird and Tatlock (London), Ltd.. which has just been issued, will be useful to all teachers of physiology and biochemistry. It contains apparently every piece of physiological apparatus which has ever been used, as well as some that have not, and are never likely to be. That, however, is no concern of the authors. In many cases it is certain that they do not themselves make the appliances they illustrate; their chief concern is to deliver the goods, and we wish them every success in this effort. We also wish that some of the prices were a little more reasonable; no doubt some of these are only approximate, and subject to revision. For example, four sizes of bulldog artery forceps are listed; the illustration of these appears in three places in the catalogue. On p. 451 the prices are 3*s.* 9*d.*, 4*s.* 3*d.*, 4*s.* 9*d.*, and 5*s.* 3*d.*; on p. 179 (item P. 1115, not 115 as indexed) the prices are 4*s.*, 4*s.* 3*d.*, 4*s.* 9*d.*, and 5*s.* 6*d.*, while on p. 72 they are given as 4*s.* 9*d.*, 4*s.* 9*d.*, 5*s.*, and 4*s.* 6*d.*, respectively. Items of interest to clinicians are the Sanborn metabolism apparatus, various polygraphs, and sphygmomanometers, and a whole section on apparatus for testing special senses. It will be particularly comforting to those abroad to know of one single firm that can supply such a diversity of wants. Even operating theatre and X ray outfits are included.

MENTAL DEFECTIVES AND CRIME.

THE Guardianship Society for the Care of the Mentally and Physically Defective, which has its headquarters at Brighton, held its annual meeting on June 7th, the chairman of the society, Mr. J. A. Nix, J.P., presiding. 371 patients were cared for during the year as against 369 in the previous year, and the increasing number of public authorities from whom cases are received mark the usefulness of the organisation. Dr. W. A. Potts, psychological expert to the Birmingham justices, gave an address on Mental Defectives and other cases suitable for organised care. A certain proportion of juvenile delinquents, he said, could be much better dealt with by guardianship than by the methods usually employed. What the majority of them required was love and sympathy. The juvenile delinquent was of extreme importance to the whole community, because nearly all habitual criminals commenced their careers in youth, and in very many instances that fact was due to the unsatisfactory homes in which they were brought up. Justices made the mistake of sending back to their homes children who were making a first appearance, and who ought to be examined by psychological experts. Such a society as the Guardianship Society would be the best means of dealing with young offenders. Dr. Potts believed that by suitable treatment—preferably by guardianship—many of those who had lapsed into crime could be reclaimed. The meeting closed with a tribute to the work of the hon. secretary, Miss Grace Woodhead.

OPHTHALMIC HOSPITALS IN EGYPT.

FROM the eighth annual report of the Ophthalmic Section issued by the Director of Ophthalmic Hospitals in Cairo, and covering the year 1920, we learn that the number of ophthalmic hospitals in Egypt has increased to 20, five of them being travelling hospitals. The number of new patients treated during the year 1920 was 94,921, the number of operations was 56,503, and the number of attendances of out-patients over a million. The present report begins by referring to the death of the founder of these hospitals, Sir Ernest Cassel. The body of the report is largely occupied by an account of the treatment of trachoma, which is nearly universal in Egypt, and of acute conjunctivitis, to which latter disease the bulk of the existing blindness is due. Out of 108,000 patients examined 5000 were blind in both eyes, another 10,000 being blind on one side. The treatment of acute conjunctivitis, which has been carried out for more than ten years, is attended with surprisingly good results, and it may be said that if treatment is commenced before corneal ulceration has occurred this complication rarely develops. Some space is devoted to a case of a rare disease, palpebral sporotrichosis, which occurred in a syphilitic subject and bore a strong resemblance to syphilitic ulceration, but was proved to have quite a different pathogenesis. Following the letterpress are tables which continue to show, as in Dr. A. F. MacCallan's previous reports, the relation between the time of year and the prevalence of the activities of the gonococcus, the Koch-Weeks bacillus, and the Morax-Axenfeld bacillus respectively.

DISTINCTIVE LETTERS FOR NURSES.

To the Editor of THE LANCET.

SIR,—It seems extremely desirable that the medical profession should realise the significance of certain recent proposals of the Registration Committee of the General Nursing Council. This Committee considers it essential that there should be distinctive letters for nurses on the general and supplementary parts of the register. It is suggested that the letters S.R.N. (State Registered Nurse) be used by the general nurse; R.M.N. (Registered Mental Nurse) by the mental nurse; R.C.N. by the registered sick children's nurse; R.F.N. by the fever nurses, the letters to be worn on shoulder straps on the uniform (see *Nursing Mirror*, May 27th).

As soon as the meaning of these symbols becomes generally known, any patient recovering from an acute infective fever, who seeks a health resort accompanied by her nurse, will have the nature of her late malady revealed to the unsympathetic eyes of the hotel keeper and his guests, while patients suffering ailments of a mental or nervous character will bear with them in public, whenever a uniformed nurse accompanies them, diagnostic information from which we may safely assume the worst possible inference will be drawn by all who see it. It would be superfluous to enlarge on the feelings likely to be in the minds of the nurses thus labelled, and in that of the public, should this ill-advised proposal ever be carried into effect.

I am, Sir, yours faithfully,
M. C. WALSHE,
Manager, Mental Nurses' Association.
8, Hinde-street, Manchester-square, W., June 7th, 1922.

*** We understand that the whole question of uniform is still under the consideration of the General Nursing Council.—ED. L.

Messrs. Arnold and Sons inform us that they have acquired the lease of 52, Wigmore-street, W., comprising two spacious showrooms, adjoining their existing premises of 50 and 50A, Wigmore-street. The new premises will be devoted to showrooms for hospital furniture, surgical instruments, orthopædic appliances, invalid furniture and the like, with a view of establishing under one roof an organisation catering completely for the requirements of physician, surgeon, and hospital.

THE LANCET of Jan. 7th, 1922.

THE Manager will be obliged to readers who have not any further use for their copies of THE LANCET of the above date if they will kindly return them to him at 1, Bedford-street, Strand, W.C. 2. The postage on each number is three halfpence. He will be pleased to pay for those returned.

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